ENGINEERING NEWS-RECORD

Cities say Merry Christmas with big trees p. 24

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A McGRAW-HILL PUBLICATION

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* * *

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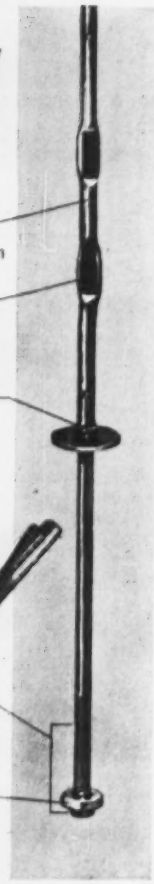

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Guide to better pump selection

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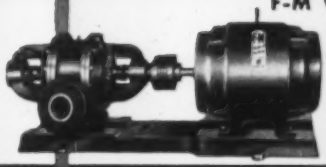
boiler feed condensate return hot and cold liquids chemicals refrigerants, etc.	up to 200 gpm. pressures to 900 ft.	 **F-M WESTCO PERIPHERAL PUMPS** High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼" through 2½".
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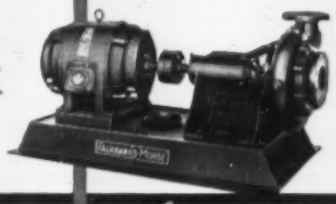
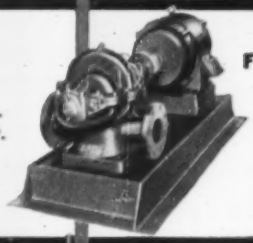
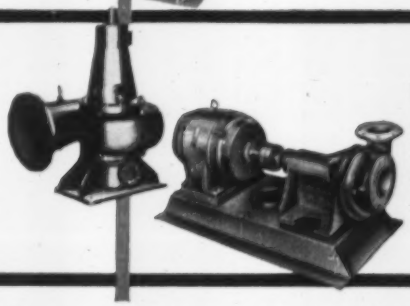
sewage slurries paper stock fruit shrimp vegetables, etc.	up to 30,000 gpm. pressures to 175 ft.	 **F-M NON-CLOG PUMPS** Unexcelled for clog-free handling of liquids with solids in suspension. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.
water supply plant service booster circulating air conditioning refrigeration chemical liquids boiler feeds, etc.	up to 50,000 gpm. pressures to 700 ft.	 **F-M SPLIT-CASE CENTRIFUGAL PUMPS** High, sustained efficiency over wide range of conditions. Low-cost maintenance. Sizes 1½" through 36". Single stage or multistage.
hot and cold liquids chemicals circulating liquids nonviscous liquids cooling towers condenser circulation, etc.	up to 100,000 gpm. pressures to 250 ft.	 **F-M END-SUCTION PUMPS** A wide line of rugged, precision-built pumps. Sizes ¾" through 54". Horizontal or vertical centrifugal.

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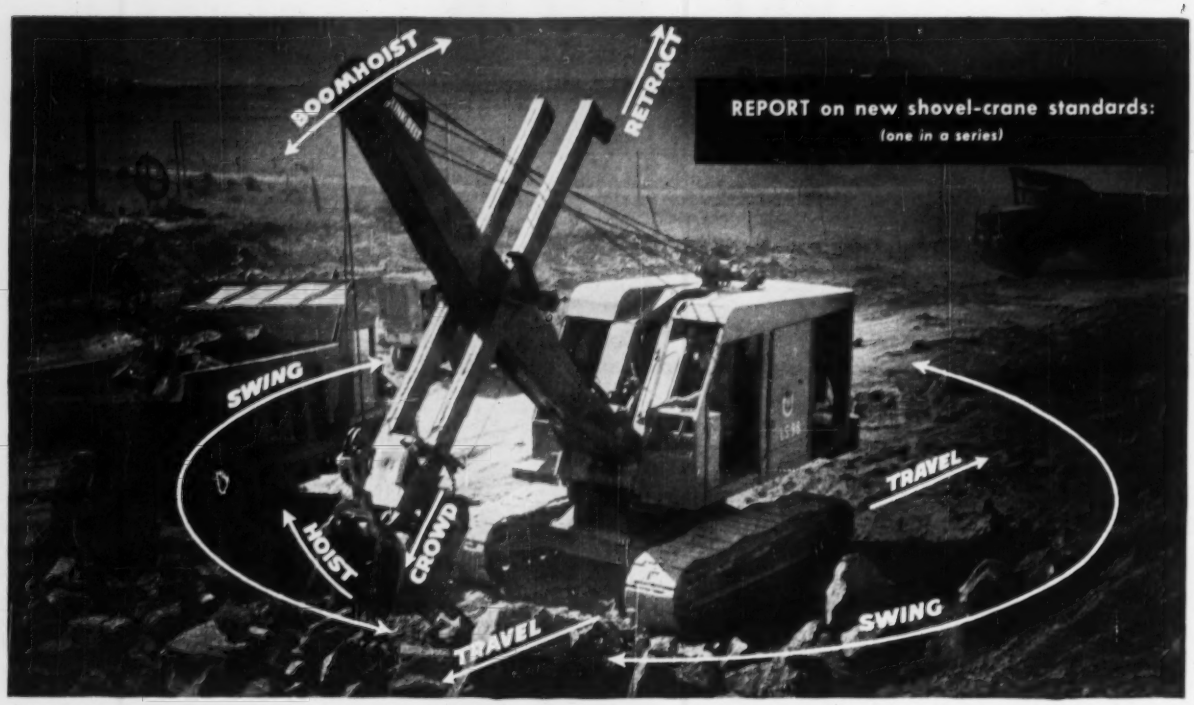

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14,324

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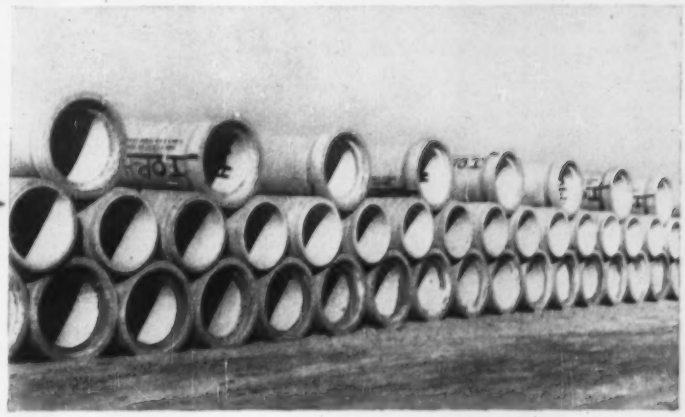

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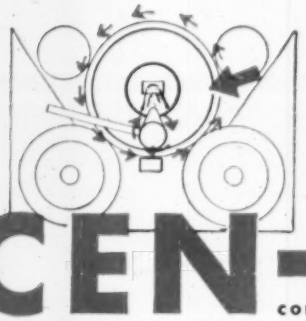

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Reader Comment

Computers in Pile Driving

SIR—"What Happens When Hammer Hits Pile" (ENR Sept. 5, p. 46) was indeed interesting and provocative. However, application of the wave equation in this case seems to be a problem better suited to solution by electronic analog computers.

I believe that further application of this equation to pile driving could be accomplished faster and more economically with analog equipment, or electronic differential analyzers, as they are often called. Such computers would allow simple, rapid modification of the characteristics of hammer, pile, and soil during operation with immediate response of the computer giving all desired data simultaneously.

Use of such equipment would probably permit a more thorough investigation of this problem than might otherwise be economically feasible.

WILLIAM H. MCTIGUE, JR.
Dames & Moore
New York, N. Y.

•

SIR—The engineering fraternity is indebted to Mr. Edward A. Smith and the Raymond Concrete Pile Co. for imparting new impetus to the use of the wave equation as a means of determining pile bearing capacities. Although Mr. Smith presents a lucid explanation of the historical background of the use of the theory his conclusions leave something to be desired.

The conclusions drawn by Mr. Smith are based on the following assumptions:

1. The ultimate driving resistance is equal to the bearing capacity. This premise must be justified.

2. The pile is end bearing and laterally unrestrained. Under these conditions conventional column formulas apply, providing the soil under the pile tip possesses sufficient compressive and shear strength.

3. Skin friction is neglected. This assumption leads to conservative results when employing the wave equation. However, Mr. Smith's graphs indicate that Hiley's, Gates' and the Pacific Coast Formulas yield lower values than the wave equation. Hence these formulas, by inference, are ultra-conservative. This, however, is not the case.

In "Tests Tell H-Pile Story," (ENR April 5, 1956, p. 90), one result showed that only 14% of the total applied load was transmitted to the tip of a 10 in. H-pile driven more than 100 ft through clay to bedrock. Similar results have been obtained by other investigators. All facts considered, it is wise to view graphs 1, 2, 3 and 6 with askance.

Nevertheless, Mr. Smith is to be commended for his ingenuity in dealing with the problem. All conclusions and comparisons, however, must be reserved until the wave equation is solved for conditions which more closely reflect the true nature of the co-action between pile and soil.

MARVIN GATES
Project Engineer
Goodkind & O'Dea
Bloomfield, N. J.

•

SIR—The interesting article by Edward A. Smith is correctly titled "What Happens When Hammer Hits Pile" but incorrectly implies that the dynamic response of the pile and soil is equal to the ultimate pile capacity to carry a static load.

The wave equation, if the correct assumptions are made, may yield the correct curves of displacement vs time (Figs. 4 & 5) but there is no assurance that computed "ultimate driving resistance" would be verified by a static load test to be the same as the ultimate pile capacity. Until the results of the wave equation are substantiated by correlation with a variety of pile loading tests, the following comment by Terzahi and Peck, "Soil Mechanics in Engineering Practive," p. 466, relative to the Redtenbacher and Hiley formulas is perhaps equally applicable to the wave equation: "Since—more elaborate formulas—contain factors representing the weight, dimensions, modulus of elasticity, and coefficient of restitution of the pile, they convey the impression of greater reliability. However, experience has shown that they are almost as inaccurate as the simpler Engineering News formula."

A dynamic formula, no matter how many variables are included, is still dependent on the assumption that a foundation soil's reaction to a static loading is represented by its reaction to the dynamic driving, and the validity of this assumption is subject to serious doubt. Therefore, even the precise mathematical solution by a digital computer may not be correct due to an invalid assumption.

JOHN A. FOCHT, JR.
Chief Design Engineer
McClelland Engineers, Inc.
Houston, Tex.

•

SIR—I feel Mr. E. A. Smith and Raymond Concrete Pile Co. deserve special commendation for the graphs given in the article "What Happens When Hammer Hits Pile" and because of the ENGINEERING NEWS formula and its historic association with you, it seems appropriate that this should be printed in ENR.

I wonder, however, if some readers will fail to appreciate that the "wave formula", to which some credit could also be given to Glanville, Grime & Davies (Inst. C. E., Dec. 1935) indicates the instantaneous peak stress and this, I suggest, is not proved to be necessarily directly related to the resistance to penetration.

Mr. Smith has pointed out that the latter is usually only related to the safe load on a pile when the soil neither "sets up" or "relaxes", but I fear that even with granular soils we still need to know more of the relation between the instantaneous peak stress and the resistance to penetration. For example, how does a stress wave of say 40,000 psi for 1/400 of a second compare for penetration with 20,000 psi for a longer time. As an extreme case a stress of 60,000 psi for an infinitesimal time might possibly dent the top of a steel pile but not cause any penetration at all. I should perhaps add the total duration of the hammer blow is often around 1/100 of a second and during that time there is great fluctuation of stress in the hammer not shown by the graphs illustrated.

I have had the pleasure of knowing Mr. Hiley, the late Mr. Crandall and Mr. A. E. Cummings and that article worthily continues their work.

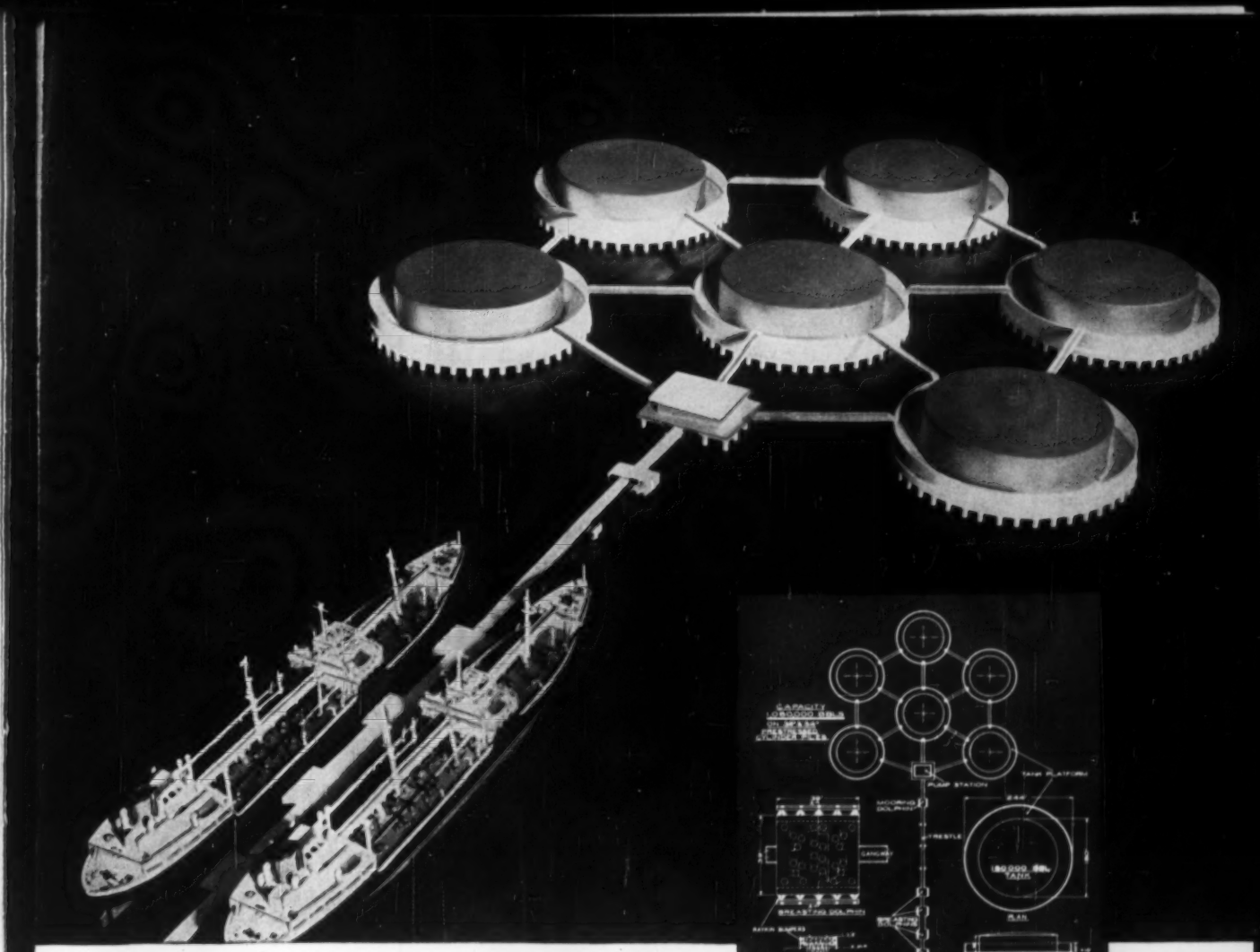
It was Cummings who pointed out the implications of the 1935 Building Research Station tests of instantaneous stress in piles and I agree with Mr. Smith, the Hiley formula seems to give unduly low results for long piles but don't fully agree, if correctly used, the formula can give widely varying results.

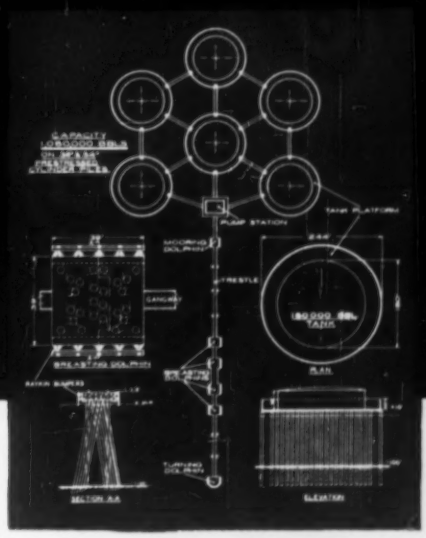
The Hiley formula has now been much used for many years and even if pessimistic for long piles, and I personally believe incorrect, at least in its efficiency of blow term, it is widely believed to be the only impact formula with reasonable accuracy over a fair range of types of piles and conditions.

Out of the 38 formulas mentioned by Mr. Smith it is one of the very few still worth considering.

(Continued on page 9)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.





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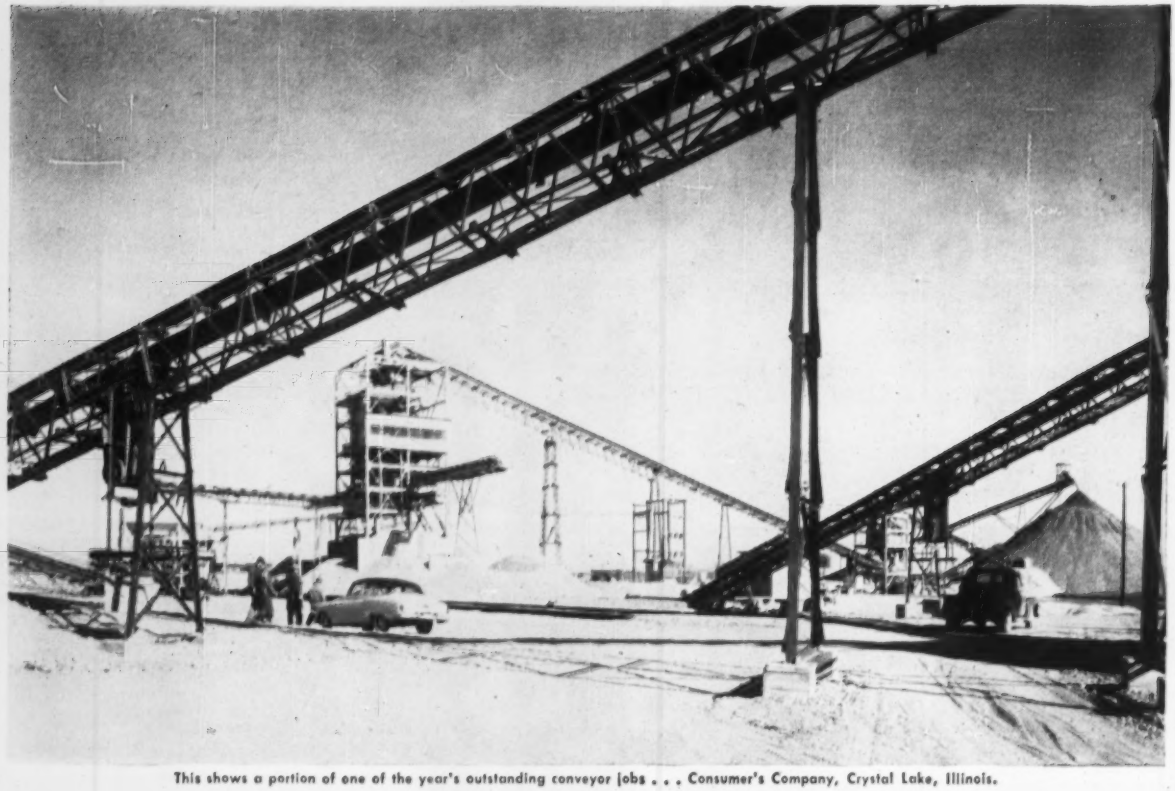

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However, use of the coefficient of restitution and also the efficiency of the blow in the Hiley formula seems at least a partial duplication and if we knew the precise type of correction needed it would give higher results for heavy piles, which of course are usually long piles.

All this is, I think, beyond the scope of the digital computer, so good luck to Mr. Smith in continuing his valuable work, but preferably on the basic problem as to if and how the wave formula is related to resistance to penetration.

DONOVAN H. LEE
Consulting Engineer
London, England

Not First, But New

SIR—Your report on the ASCE Power Division symposium on underground power stations (ENR Oct. 24, p. 22) contains a brief but misleading reference to my paper on the Ambuklao power station in the Philippines.

Please be informed that (1) the Ambuklao station is not the first underground power station in the Philippines, and (2) a horizontal generator-turbine shaft with a Pelton or impulse wheel is a common thing. A horizontal shaft, however, with an overhung Francis runner as used by the late L. F. Harza at Ambuklao (and before that at the Guayabo project in El Salvador) represents a rather unique design.

The purpose of my paper was to stress this point and discuss the advantages and problems of this arrangement. Not a single other power station described at the symposium was similar to Ambuklao in this respect.

ANDREW EBERHARDT
Harza Engineering Co.
Chicago, Ill.

Frame-Shear Method

SIR—Since such diverse results were obtained by the four methods used by Murray Rubin in distributing horizontal shear (ENR May 23, p. 10), we felt that a solution based on a rigorous method was in order. The strain-energy method was used.

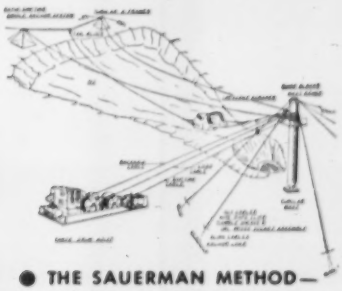
We compared the shears obtained using the systems presented by Mr. Rubin with those obtained by the strain-energy method and another method evolved by the M. W. Kellogg Co.

The Kellogg method is based on the bent considered as a vertical cantilever frame. Since this frame deflects as a unit, the shear required to deflect any column at the footing is a function of the relative stiffness of that portion of the frame. The stiffness, in turn, is a

Profitable Bulk Material Handling Starts with a Sauerman DragScraper
digging *and hauling to plant*

This digging and hauling operation is being handled with a 3-yd. DragScraper.

This 2-yd. DragScraper is dumping river gravel dug from 50 ft. of water into grizzly feeding conveyor to plant. *See Sauerman News No. 147.*



● **THE SAUERMAN METHOD**—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

A Sauerman DragScraper handles the two basic steps of material flow—digging and hauling—in one continuous operation. No double handling is required. You cut labor costs in half—or even more—because a single machine, controlled by one man, replaces the multiple equipment required by other methods.

Profitable handling is further assured by a maintenance cost of only 1½ cents per cu. yd. for the average size Sauerman installation. On larger machines, the increased volume drops this cost still lower. You'll save money on power, too, by eliminating heavy machinery with limited handling-to-dead weight capacity. You pay only the cost of moving the actual digging tool—a Crescent DragScraper.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, depth and plant layout. DragScraper machines in sizes from ⅓ to 15 yds. provide delivery at the lowest cost per cu. yd.

Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of materials handling and excavating machinery experience. Ask for Catalog A (DragScrapers).

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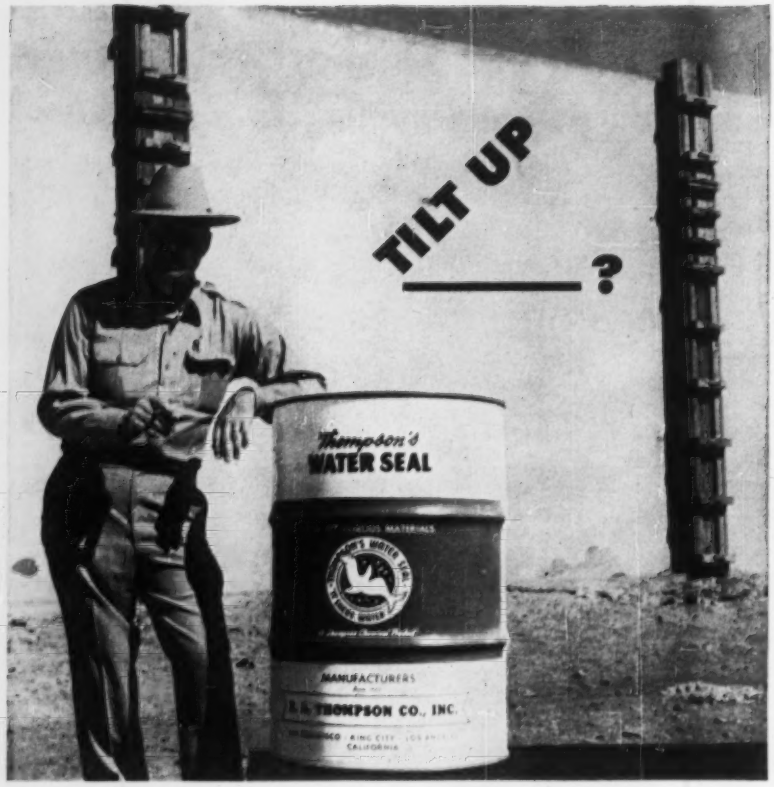
Cable: CABEX—Bellwood, Ill.

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks



here's the West's Answer to your Concrete Questions!

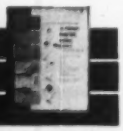
* **What parting compound delivers smooth concrete without leaving stains or residue that interfere with painting?**
"Thompson's Water Seal eliminated the problem of stains in our tilt-up concrete walls. Now panels are easily removed from the surface slab and painting proceeds speedily."
ASSOCIATED CONSTRUCTION AND ENGINEERING COMPANY OF CALIFORNIA, San Francisco, Calif.

* **Is there one curing, separating and form-sealing method that easily produces hard, dust-free surfaces?**
"Of all the chemicals we tested in our tilt-up work, Thompson's Water Seal proved the cheapest insurance against costly grief and painting troubles."
BAYCITIES CONSTRUCTION CO., Oakland, Calif.

* **Is it possible to prevent all moisture damage in concrete under pressure or capillary action, regardless of weather?**
"As waterproofing specialists in heavy construction work, we use Thompson's Water Seal on all concrete moisture problems with constant success and at a great saving."
STANLEY H. KOLLER CONSTRUCTION, Crockett, Calif.

THOMPSON'S (deep penetration) WATER SEAL is distributed nationwide by building supply companies and paint and hardware dealers.

For complete specifications, write for new booklet 7-A-4



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. . . Reader Comment

function of the area of the column and its distance from the center of gravity of the bent. We have found that the diagonal bracing has very little effect on the shear distribution, except in short, wide structures of a type in which the horizontal shear forces usually are not critical.

The values of the reactions obtained by the methods are summarized below:

Method	R_1	R_2	R_3
Equal Shear Distribution	+0.20	−0.25	−0.25
Distrbution Proportional To Width	+0.33	0	−0.33
Geometric Moment of Inertia of Bent	+0.20	+0.20	−0.40
Area of Diagonal Section	+0.28	+0.08	−0.36
Kellogg Cantilever Beam Method (Moment of inertia of all column areas considered as beam flanges)	+0.40	+0.40	−0.80
Strain Energy Method	+0.48	+0.28	−0.76

The Kellogg method gives results much closer to those of the strain-energy method. If a taller structure were so analyzed, the divergence between the results of the two methods would have been even less.

GEORGE M. FRIEDMAN
Milton Hartstein
M. W. Kellogg Co.
New York, N. Y.

First Gold-Hued Panels

SIR—The news item, "Skyscraper Gets First Gold-Colored Panels" (ENR Nov. 7, p. 28), stated that the first application of gold-anodized aluminum for buildings was its use in the building at 575 Lexington Ave. Actually, the first use of gold-anodized aluminum to our knowledge was on the five-story Franklin National Bank building at Roosevelt Field, Long Island, N. Y. This building is scheduled for occupancy by the Franklin National Bank on Dec. 1.

JOSEPH STEIN
Project Engineer
Webb & Knapp Construction Corp.
New York, N. Y.

CALENDAR

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 6-10.

National Association of Home Builders, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 19-24.

American Road Builders Association, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 20-23.

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 26-30.

American Society of Heating and Air-Conditioning Engineers, annual meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Jan. 27-29.

Society of Plastics Engineers, Inc., 14th annual technical meeting, Sheraton-Cadillac Hotel, Detroit, Mich., Jan. 28-31.

Electric controls speed work-motion of Tournapulls. 210 hp, 18-yd. "C", shown, is controlled by fingertip switches on dashboard. Simple, weatherproof motors give split-second response in powering apron-lift, tailgate motion, bowl-hoist, and steer. World-wide use over many years proves electric controls easiest to use and to maintain, fastest acting.

When is the best time to replace an earthmover?

There's a new standard, in earthmoving, for deciding when a machine needs replacement. Years ago, you remember, you were guided mainly by maintenance cost. If repair bills on any rig got out of hand, out it went. But that was when jobs where smaller, profit margins bigger: when *production* wasn't so all-important. Today, smart operators judge the obsolescence of a machine not so much by what it costs to *maintain*, but by what it can or cannot do in the way of *production*.

A loser . . . yet still in "good shape"

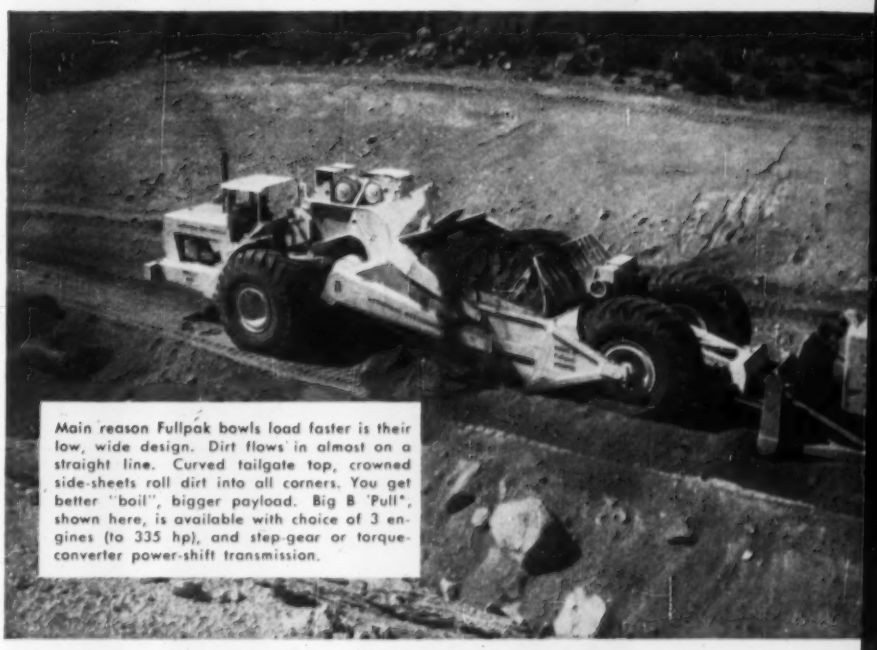
That's why, nowadays, a scraper can be a liability and ripe for replacement even though it still functions smoothly. Cost-conscious contractors realize that no matter *how* maintenance-free a scraper, if it's not moving maximum yardage, at *lowest-net-cost-per-yard*, it's just too expensive.

Consider, for instance, an imaginary project in which a scraper is completing a load-haul-and-spread cycle in 5.55 minutes . . . for 9 cycles every 50-minute hour. Assume, too, that it averages 11 pay-yards each trip. You're moving 99 yards an hour with that scraper . . . and if you've bid your job right, you're probably making money.

Compare with bigger, speedier unit

Now, however, look at what a scraper that loads, hauls, and spreads *faster* . . . and that has a bigger payload capacity . . . can do. If it knocks off just a half minute per cycle, it will complete 9.9 cycles an hour. And if it also packs in just 2 more yards per load, you're moving not 99 yards an hour, but 128.7. At the national average rate of about 40¢ a yard, you'd be earning $11.88 more per scraper per hour!

Project those figures, and each of your faster, bigger scrapers would be earning for you $118 more every 10-hour day . . . $649 more every 5½-day week. In other words, the smaller, slower, old-fashioned scraper is *costing* you $649 a week to keep on the line! Not in maintenance costs . . . not in ownership or operating costs . . . but in reduced income *potential*.



Main reason Fullpak bowls load faster is their low, wide design. Dirt flows in almost on a straight line. Curved tailgate top, crowned side-sheets roll dirt into all corners. You get better "boil", bigger payload. Big B 'Pull*, shown here, is available with choice of 3 engines (to 335 hp), and step-gear or torque-converter power-shift transmission.

That's the kind of scraper that needs replacing — no matter *what* shape it's in.

Move more yards faster . . .

That's why fast-traveling Tournapulls®, with easy-loading *big*-capacity Fullpak® scrapers, are replacing so many earthmoving tools . . . both old and new . . . around the nation. Tournapulls will *not*, of course, move 128.7 yds. an hour on every job, in every condition — the figures quoted above are based on a hypothetical situation — but what they *will* do, on every job, is to move *more* yards *faster* . . . at the *lowest-net-cost-per-yard*.

Ask for full details, and a demonstration of Tournapull . . . available in 9, 18, and 27-yd. heaped capacities.

"Handyman" scraper of Tournapull line is 138 hp, 9-yd. "D". Like all 'Pulls, it has exclusive power-transfer differential, to keep you working in mud and slippery conditions. When one wheel starts to slip, this differential transfers torque-power to wheel on solid footing, keeps you moving. With 90° kingpin steer, you can "duck walk" out of trouble, too . . . turning prime-mover side to side until you're on good footing again. *Trademark P-1732-DC-1

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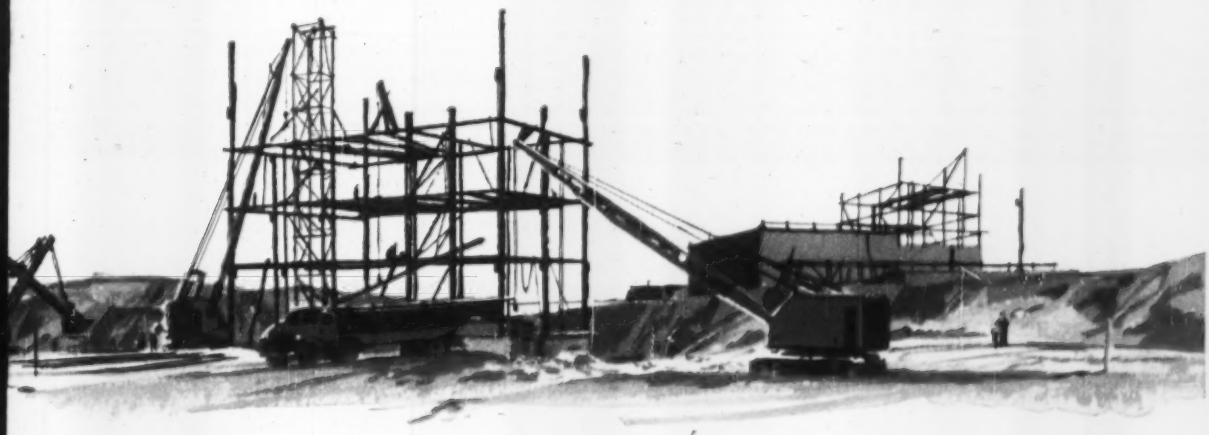
OF SHOVELS, CRANES AND HOISTS



LEADING manufacturers offer General Motors Diesel power in 156 different models of shovels, cranes, draglines and hoists—shovels from ⅜ yd. to 3½ yd.; cranes and hoists to 250-ton capacity.

Because these modern 2-cycle Diesels deliver power at *every* piston downstroke, they pack more usable power in less space. They start easily and pick up under load fast—maintain constant speed which pays off in easier digging and hoisting, faster cycles, high production and bigger profits.

Both single and multiple engine units are available with either mechanical or torque-converter drives—and with optional Hydrostarter which gives you positive, split-second starts, and eliminates the troubles and expense of electric starting systems.

When you standardize on GM Diesel power in your equipment, you get work done faster at less cost—lower initial cost, lower maintenance cost, lower parts cost. A single inventory of interchangeable parts serves all engines in a series—so you can operate with lower inventories and with far less time out for servicing.

And you have the backing of a worldwide network of GM Distributors and Dealers—with complete parts stocks and service facilities readily available everywhere.

Whatever excavator, crane or hoist you buy, you're money ahead with a "Jimmy"—*it's the world's thriftiest Diesel!*

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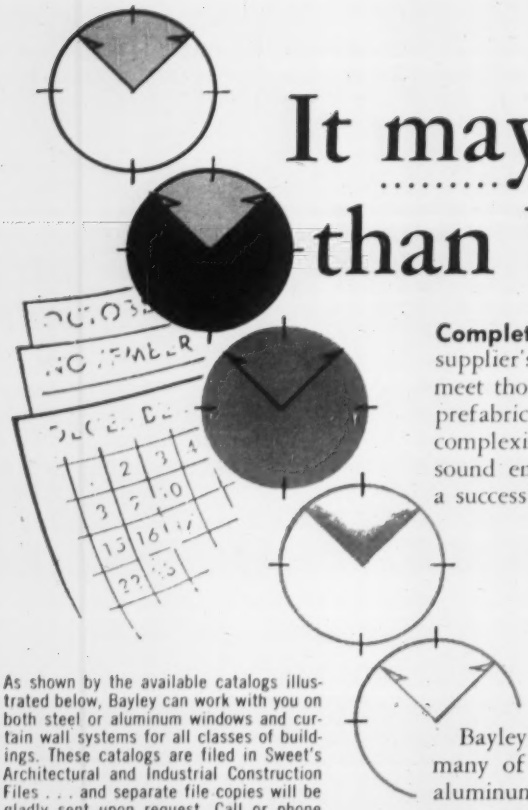
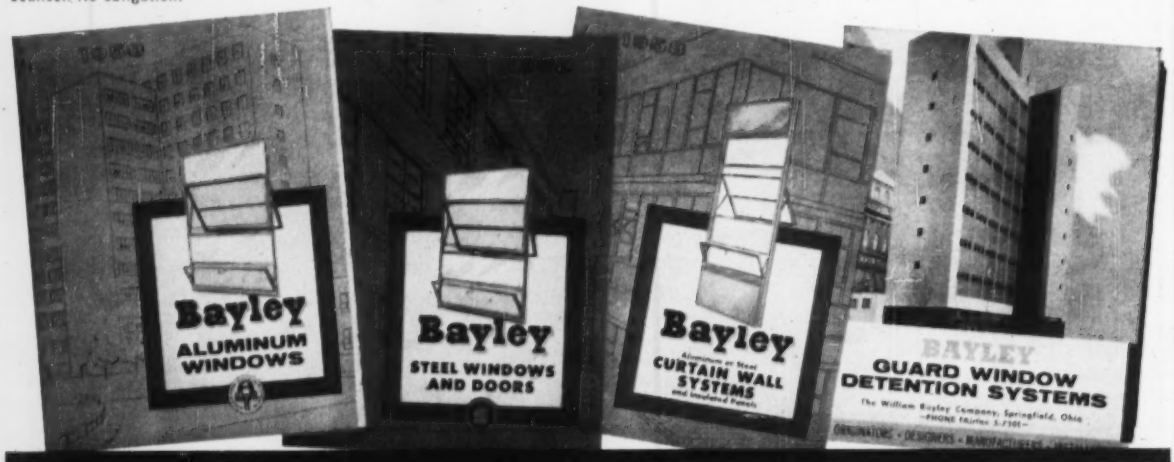


Completion dates ARE vital. The earlier you can get your window supplier's counsel, the better service he can render in helping you meet those dates. This is more true today than ever! Windows and prefabricated curtain walls are of major importance and of increased complexity in today's buildings. Because of this, Bayley considers sound engineering service rendered to you—*early*—the essence of a successful contract.

- *It results in a sound wall.*
- *It allows individualized treatments.*
- *It saves designers' time.*
- *It eliminates re-work time.*
- *It effects increased economies.*
- *It permits earlier approvals.*

As shown by the available catalogs illustrated below, Bayley can work with you on both steel or aluminum windows and curtain wall systems for all classes of buildings. These catalogs are filed in Sweet's Architectural and Industrial Construction Files . . . and separate file copies will be gladly sent upon request. Call or phone your local Bayley Representative for counsel. No obligation!

Bayley has had years of experience in originating and designing many of today's most important developments in both steel and aluminum windows and curtain-walls. So, when you call Bayley you are placing your requirements in "experienced hands".



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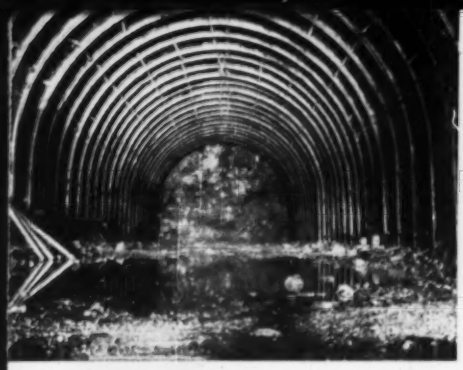

Tunnel face ready for drilling. Completed, this 33-foot tunnel, 2,340 feet long, will divert the flow of the Trinity River during construction of the Trinity Dam and power tunnel near Lewiston, California.

Loading Du Pont Gelex No. 2, 1¼ x 12 primed with Du Pont MS Delay Electric Blasting Caps which insure good fragmentation, a "must" in tunneling operations.

Connecting up and checking the parallel series Electric Blasting Cap hookup.

Blaster about to fire a round with a Du Pont CD-48-1 Blasting Machine which eliminates the need for generators or permanent power lines for blasting.

Dumping the muck after the blast. The combination of Du Pont Gelex No. 2, Regular and MS Delays produces excellent fragmentation.

The north portal shows the size of this tunnel that is being blasted through solid rock.

Pouring a River Through a Mountain ...with Dynamite

Excellent fragmentation speeds muck removal on the Trinity Dam Diversion Tunnel being constructed by the Gates & Fox Company of Burlingame, California.

Built near Lewiston, California, under the direction of the United States Bureau of Reclamation, the tunnel will divert the Trinity River during construction of the Trinity Dam and power tunnel.

It is being driven with a full face using a Du Pont Explosives team. The explosive is Du Pont Gelex No. 2, 1¼ x 12. Du Pont Regular and MS Electric Blasting Caps provide the excellent fragmentation necessary for fast muck removal.

A CD-48-1 Blasting Machine rounds out the Du Pont team. It eliminates the need for generators or permanent power lines for blasting.

Whether you're driving a large tunnel for water diversion or a small one for sewage disposal, Du Pont can supply a well-integrated explosives combination to give you perfect results.

A Du Pont representative will be happy to help you choose the right explosives team to fit your particular requirements. See him right away, or write to E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

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SEE DU PONT SHOW OF THE MONTH ON CBS

LONG LIFE UNDER WATER!

The giant marine turtle, or "leatherback", is reputed to live for 250 years. This tremendous life span is, in part, attributable to its tough, durable shell—a natural protection against the rigors and constant buffeting of underwater life.

LOCK JOINT REINFORCED CONCRETE SUBAQUEOUS PIPE owes much of its unusual underwater longevity to its "shell"—the dense concrete wall which makes it practically ageless. To assure the strongest possible concrete, periodic compressive tests are taken of each day's run of concrete in every Lock Joint plant. This is only one of the many quality control measures marking every phase of the manufacture of Lock Joint Pipe.

Can you guess how many cubic yards of this high quality concrete were required in the production of the 18,000 ft., 120 inch diameter Lock Joint Reinforced Concrete Subaqueous Pipeline for the intake of Cleveland's water supply system? The answer can be found in the picture above.

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THE CONSTRUCTION WEEK

LEGAL ROADBLOCK—A recent decision by the Washington State Supreme Court is seen as increasing the likelihood of delay on highway projects where land condemnation is involved. The court dismissed a state appeal on an award made by a lower court in a condemnation case. The high court ruled that the state lost its right of appeal when it paid the amount of the award to the superior court and took possession of the land. Legal observers said that in the future, when the Highway Department feels that a condemnation award is excessive, it will be forced either to pay the award, or delay work until an appeal is settled.

EXPENSIVE SURVEY—Just how expensive the time honored business of forgetting about underground utilities can be was dramatized recently in Rhode Island. State budget officials were asked to approve $50,000 for a survey to locate steam, water, sewage, electric and telephone lines at state social welfare institutions. The last comprehensive location plan was made in 1935. Yet so many unrecorded changes have been made since then, says the Department of Welfare, that no one is sure where all the lines are.

NO MORE LUMP SUM CONTRACTS—Stung by its admittedly heavy loss on a $45 million fixed price contract to construct the Dresden, Ill., nuclear power plant, General Electric Co. has announced it will accept no more fixed price contracts in nuclear power work. All future contracts, said GE President Ralph J. Cordiner, will include escalator clauses. Of all the companies engaged in A-plant construction, GE was the only one to have taken a lump sum contract, this on the first privately financed project.

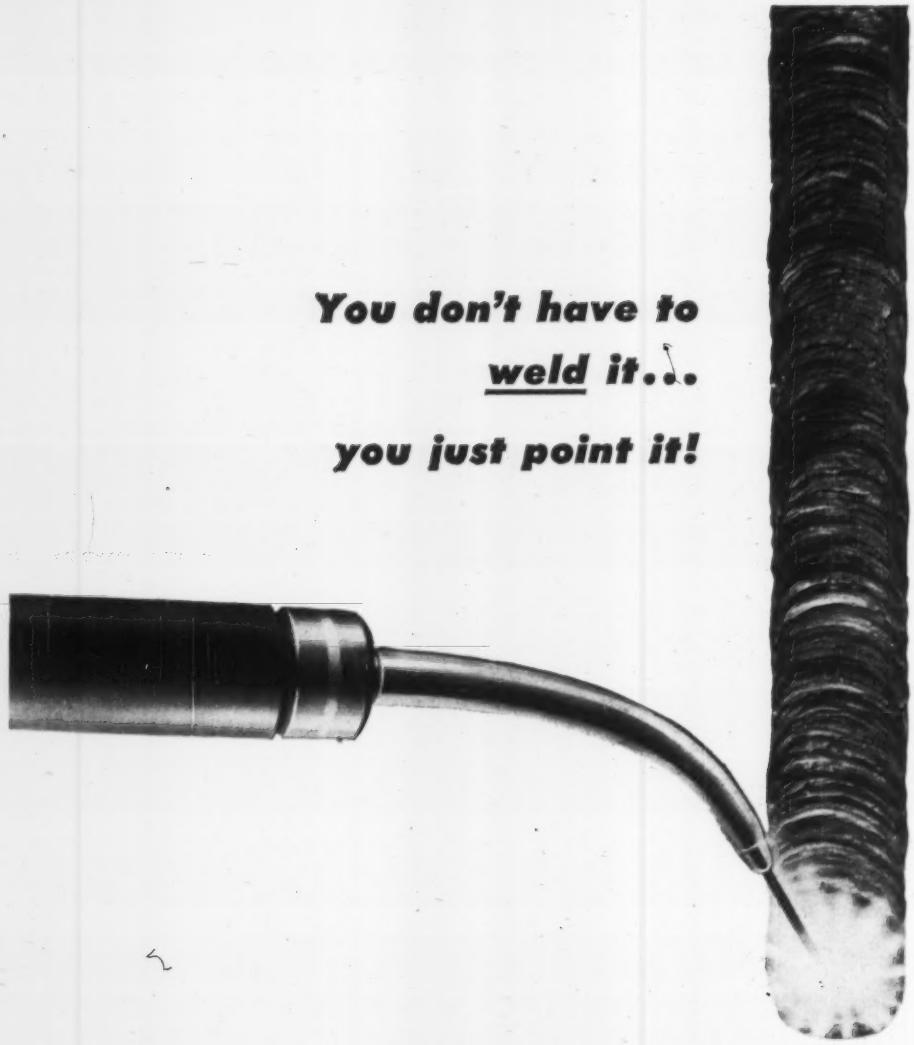
ALUMINUM BRIDGE AWARD—Construction of Iowa's aluminum-girder highway-bridge is scheduled to start December 23. The low bid came in last week at $124,680, only 0.4% above the cost estimated by Ned L. Ashton, Iowa City consulting engineer who designed the project. Reported in this column last January 17—when it was merely a subject for research inspired by the steel shortage—and again August 22—when preparation of final plans was authorized—the 220 ft, four-span continuous welded structure will carry four lanes of traffic over a divided highway in Des Moines. The low bidder is the Jensen Construction Co.-United Contractors, Des Moines. The bridge will contain 74,400 lb of structural aluminum.

NSPE NOMINATES—Clark A. Dunn, a civil engineer now administrative head of the School of Engineering at Oklahoma State University, has been nominated for the presidency of the National Society of Professional Engineers. Six vice presidents nominated for the year beginning next July are: H. A. Mosher, J. B. McGaughy, L. E. Easley, W. L. Hinderman, N. E. Hull and H. B. Blodgett.

You don't have to

weld it...

you just point it!



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The fast way to take the work out of welding!

Hard-facing with the new Stoody Semi-Automatic Wires is *that* easy! You simply "aim" the wire and strike the arc. The semi-automatic machine does the rest... automatically feeds the wire at the correct rate, lays down a sound deposit—stringer bead or wash pass.

Man, it's a weldor's dream! No fluxes, no flux dams. Perfect visibility of the weld every inch of the way. And talk about speed—2 to 4 times faster than manual welding... ideal for covering big areas quickly, extremely handy for maintaining equipment between shifts! No changing of electrodes either... welding is continuous as long as there's wire on the reel and this naturally means an end to stub end waste.

With Semi-Automatic's low heat input and low penetration, there's less dilution of the deposit. *Less dilution* means *higher alloy content* with increased wear resistance, usually superior to manual electrodes of similar analysis. There's a complete line of wires with just the right analysis for every job!

TRY SEMI-AUTOMATIC HARD-FACING THIS EASY WAY—Your Stoody dealer will arrange for a semi-automatic demonstration in your plant—on your own job. (Check the yellow pages of your phone book for nearest Stoody Dealer.) Let him prove how Stoody Semi-Automatic Hard-Facing can cut your maintenance costs!

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WASHINGTON OBSERVER

- **Highway spending rate argued**
- **Homebuilders cagey on next year**
- **Federal dollars spur sewage plants**

● **You can discount talk about an increase in the gasoline tax to step up rate of construction of the interstate highway system.** It may come eventually, but there's no chance of this happening next year.

The proposal is advanced by those who say that it's needed to keep the 16-year interstate highway building program on schedule. But Bureau of Public Roads officials say the additional income isn't needed now.

Construction, they say, is going ahead as fast as the states can spend the money. More money, therefore, won't really produce highways any faster over the next two or three years. And under terms of the 1956 law, the amount of money in the trust fund controls the rate of spending anyway.

Congress eventually will face the issue, since it is true that highway costs have risen spectacularly over the last three years. As of now, the 1954 estimate of $27 billion for the interstate net has been increased to at least $35 billion, and may go higher. On the other hand, excises on gasoline and other items contributing to the trust fund haven't risen much over the increases projected at the time the program was adopted.

Discussion of the problem will open in January when Congress gets new official estimates on costs from roads chief Tallamy.

—

● **The nation's homebuilders this week claimed that next year would see about the same number of housing starts as 1957**—that is, around a million. This is what government forecasters and others have been figuring. The homebuilders themselves actually feel that there may be a few thousand more starts next year, but hardly enough to be felt.

They condition their forecast, however, on an easing of the mortgage money market. This could come about in several ways: Federal Reserve could stimulate and create more credit; corporations may not sell stock or borrow as much to finance plant construction; the softening of business generally may reduce other demands on credit. But of course, all this would be offset by a slackening in demand for housing if recession psychology takes hold of the consumer. This would cut housing sales while it is expanding sources of financing.

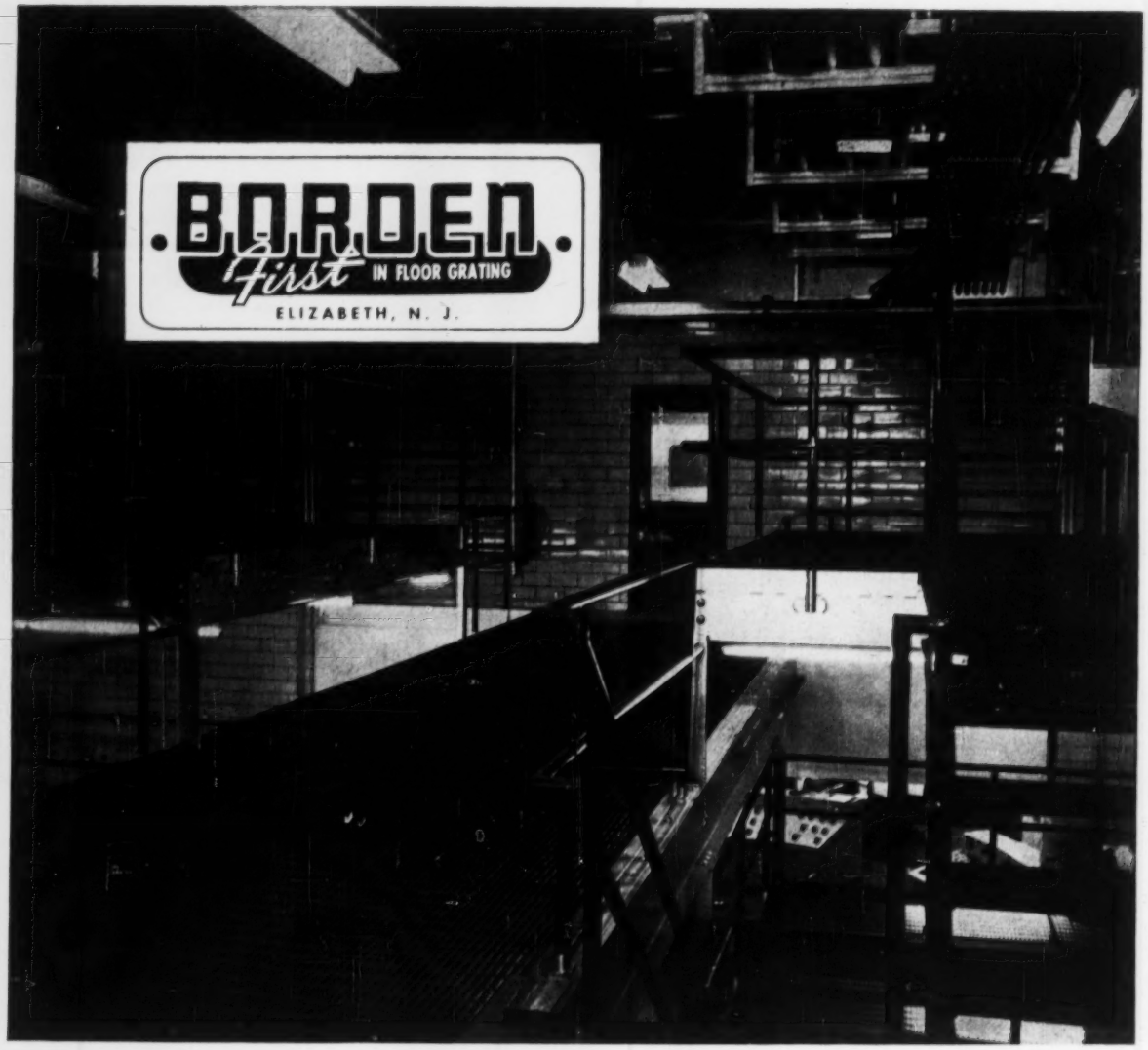
Economists already count on planned spending for highways and other public works as working against a recession of even small proportions.

—

● **Public health officials have gathered figures on sewage treatment works to show that federal subsidies help**—not hinder—local spending. The increases, they say, are substantial.

Opponents of the program have been arguing that the $50 million a year federal grants would merely replace what the cities would otherwise spend out of their own resources. But the new figures show that federal participation has actually stepped up non-federal spending (Maximum under the program is $250,000 for any one project).

Secretary Folsom is now fighting to keep a request for at least $35 million in the federal budget that's just being wrapped up. Budget Director Brundage has been against any funds at all.



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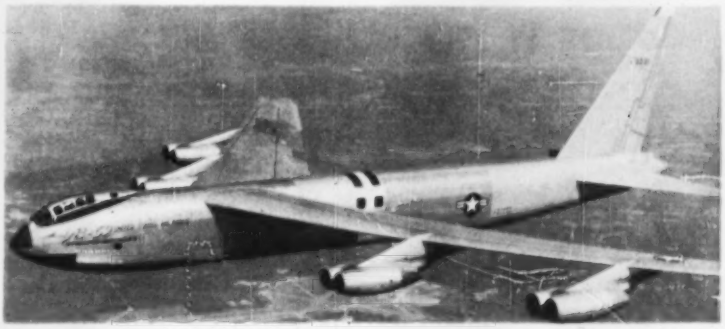
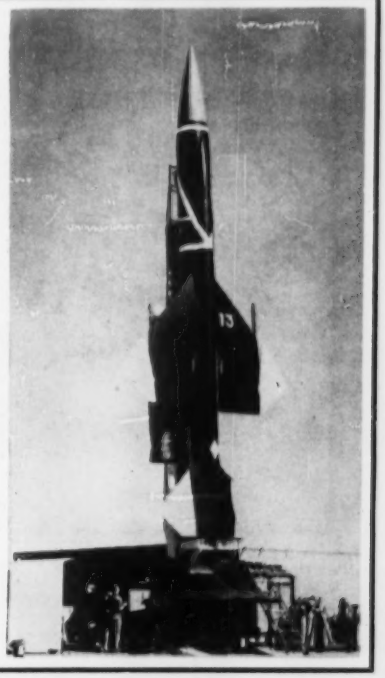


Dispersal of bases for bombers like this . . .

. . . and construction of sites for missiles →



. . . will swell the Air Force's construction volume from the present $1.3-billion-a-year level. For U. S. engineers and contractors . . .

Air Force Expansion Will Be a Big Market

All signs point to a sharp rise in U. S. Air Force construction activity over the next 18 months and more.

Air Force construction contract awards, now running at an annual volume of about $1.3 billion, will increase under the impetus of the Administration's post-Sputnik military policy turnaround, lifting the tight defense spending ceilings and accelerating the guided missile program.

The new spurt in Air Force construction shows up like this:

• Plans are being pushed for additional Strategic Air Command base dispersal. At least five existing Air Force bases will be converted into SAC installations—with longer and stronger runways, new maintenance hangars, larger parking aprons and taxi areas, additional fueling facilities, increased housing, blast deflectors to handle jet aircraft. The goal is to reduce the concentration of SAC bases in the U. S. as targets for enemy air attack, and to increase our ability to get more retaliatory bombers airborne in less time.

• Funds have been allocated for construction of the first of a chain of U. S. launching sites for intercontinental (5,500 mile) ballistic missiles. Construction is starting well in advance of final development and testing of the missile itself.

• Details are being ironed out for building four $20 million launching sites in Great Britain for the intermediate-range (1,500 mile) ballistic missile. Negotiations also are under way for construction of a network of IRBM bases in other NATO countries.

• Construction of four launching sites for the Bomarc long-range surface-to-air missile has started at a cost of $46 million. Additional Bomarc bases are in the works under plans to extend U. S. missile defenses.

• A program is being set to bolster the Distant Early Warning (DEW) line and other early-warning systems with longer-range radar and other new facilities.

Under the program for additional SAC base dispersal, the goal is to put only one B-52 heavy jet bomber squadron (15 planes) on one base. In many cases, B-52 units are now crowded with three squadrons to the base. In addition, the objective is to have but one B-47 medium jet bomber wing (45 planes) to one base. There is at least one instance where two B-47 wings are now jammed together.

Final details on the extent of SAC dispersal plans—as well as the other accelerated Air Force construction programs—have yet to be made for the fiscal 1959 defense budget.

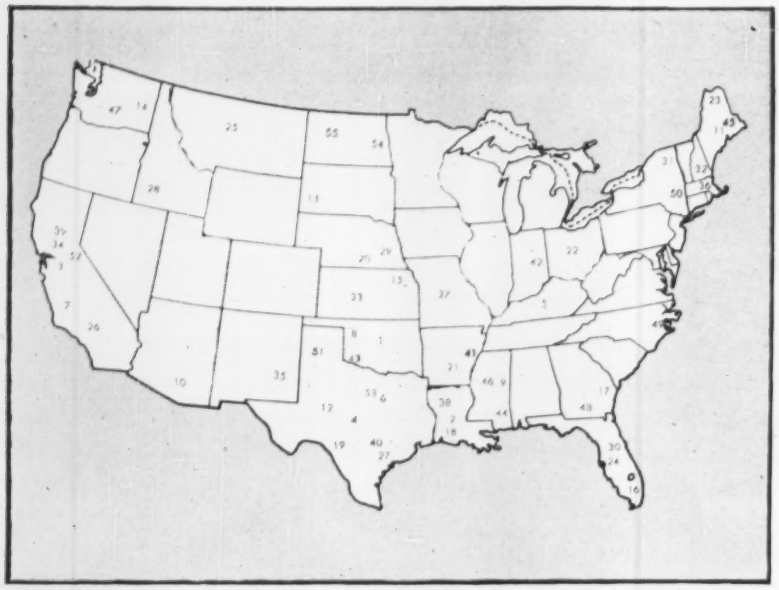
For fiscal 1957, Congress authorized $154.4 million for dispersal of heavy bomber units. In fiscal 1958, the sum went down to $135.8 million—for both heavy and medium bomber wings. Now the outlook is for a steep increase in funds next year.

• **Fast move on ICBM**—The first ICBM launching site will be put up at the Francis E. Warren Air Force Base, near Cheyenne, Wyo. The base originally was set up 90 years ago to house cavalry units for protection of Union Pacific Railroad construction crews against Indian attack.

The project is expected to cost $65 million. Last week, the Pentagon allocated $25.6 million of the sum to get construction under way in a hurry. The promptness with which the first large chunk of money was made available—the usual procedure runs to months—is interpreted as a sign of the Defense Department's serious intent to speed up construction of missile installations.

(*Continued on page 22*)

Where the Air Force Will Build



Dispersal Around These SAC Bases Is Planned . . .

1. Altus AFB, Altus, Okla.
2. Barksdale AFB, Shreveport, La. (Hqs 2nd AF)
3. Beale AFB, Marysville, Cal.
4. Biggs AFB, El Paso, Tex.
5. Campbell AFB, Hopkinsville, Ky.
6. Carswell AFB, Fort Worth, Tex.
7. Castle AFB, Merced, Cal.
8. Clinton-Sherman AFB, Clinton, Okla.
9. Columbus AFB, Columbus, Miss.
10. Davis-Monthan AFB, Tucson, Ariz.
11. Dow AFB, Bangor, Me.
12. Dyess AFB, Abilene, Tex.
13. Ellsworth AFB, Rapid City, S. D.
14. Fairchild AFB, Spokane, Wash.
15. Forbes AFB, Topeka, Kans.
16. Homestead AFB, Homestead, Fla.
17. Hunter AFB, Savannah, Ga.
18. Lake Charles AFB, Lake Charles, La.
19. Laughlin AFB, Del Rio, Tex.
20. Lincoln AFB, Lincoln, Neb.
21. Little Rock AFB, Little Rock, Ark.
22. Lockbourne AFB, Columbus, Ohio
23. Loring AFB, Limestone, Me.
24. MacDill AFB, Tampa, Fla.
25. Malstrom AFB, Great Falls, Mont.
26. March AFB, Riverside, Cal. (Hqs 15th AF)
27. Matagorda Island AFB, Port O'Connor, Tex (Training)
28. Mountain Home AFB, Ia.
29. Offutt AFB, Omaha, Neb. (Hqs Strategic Air Command)
30. Pinecastle AFB, Orlando, Fla.
31. Plattsburgh AFB, Plattsburgh, N. Y.
32. Portsmouth AFB, N. H.
33. Schilling AFB, Salina, Kan.
34. Travis AFB, Fairfield, Cal.
35. Walker AFB, Roswell, N. M.
36. Westover AFB, Chicopee Falls, Mass. (Hqs 8th AF)
37. Whiteman AFB, Knobnoster, Mo.

. . . These Dispersal Bases Are Under Way or Set to Go

38. Barksdale AFB, Shreveport, La.
39. Beale AFB, Marysville, Cal.
40. Bergstrom AFB, Austin, Tex.
41. Blytheville AFB, Blytheville, Ark.
42. Bunker Hill AFB, Bunker Hill, Ind.
43. Clinton-Sherman AFB, Burns Flat, Okla.
44. Columbus AFB, Columbus, Miss.
45. Dow AFB, Bangor, Me.
46. Greenville AFB, Greenville, Miss.
47. Larson AFB, Moses Lake, Wash.
48. Turner AFB, Albany, Ga.
49. Seymour Johnson AFB, Goldsboro, N. C.
50. Griffiss AFB, Rome, N. Y.
51. Amarillo AFB, Amarillo, Tex.
52. Mather AFB, Sacramento, Cal.
53. Sheppard AFB, Wichita Falls, Tex.
54. Grand Forks AFB, N. D.
55. Minot AFB, Minot, N. D.

The Missouri River Division of the Army Engineers has been assigned construction supervision of missile launching, storage and supporting facilities for the big project. Direct supervision will be handled by the Omaha District office. Design of special secret technical facilities is handled by Holmes and Narver, Los Angeles, Cal., architectural engineering firm. The Omaha District Engineers will let contracts for design of the supporting facilities.

Initial contracts under this program will be ready for advertising by the spring of 1958.

• **IRBM bases overseas**—It is still unclear how construction of the overseas IRBM launching sites will be handled—how construction bids are to be awarded, the role of U. S. construction contractors. According to reliable sources, three of the four British bases will be manned by British troops. The first operational IRBM squadron is supposed to be ready by December 1958—well ahead of the original target date.

One of the major topics on the agenda at this week's NATO summit conference is construction of IRBM bases in other NATO countries. The subject has become a controversial one. Some of the member nations are displeased with U. S. intentions to keep control over storage of thermonuclear warheads; others are unenthusiastic about setting up the IRBM sites within their boundaries, thus becoming prime targets for Soviet air attack.

• **Bomarc bases**—The Bomarc anti-aircraft missile bases, with an air defense range of about 300 miles, will augment the 25-to-75-mile air defense system of the Army's 244 Nike sites which already ring 18 major target areas.

Sites and costs of the first four bases are:

Dow Air Force Base, Maine, $10.5 million

McGuire Air Force Base, New Jersey, $10.5 million

Otis Air Force Base, Massachusetts, $10.5 million

Suffolk County Air Force Base, Long Island, New York, $12.5 million

Included in these costs are launching and storage and missile operating and maintenance facilities, plus control and protective equipment. Eleven other sites are reportedly being planned for construction at other Air Force coastal bases and installations along the Canadian border.

Since fiscal 1956, the portion of Air Force construction funds devoted to missile installations has risen from 1% to 20%. Over the next two years, it's likely that missile expenditures will become the dominant chunk of the Air Force's construction budget.

A Look at the Structures of Tomorrow

- Progress in cable-suspended and air-supported roofs
- New materials—lightweight concrete, metals and plastics
- New tools for structural design

A comprehensive two-day survey of some of today's unusual structures gave a glimpse of the structures of tomorrow to 900 engineers and architects attending the Third National Construction Industry Conference in Chicago.

In fact, the conference itself may portend the conference of tomorrow. For a portion of the unexpectedly large audience, which overflowed into an adjoining room, observed the program on closed-circuit television.

Sponsored by Armour Research Foundation of Illinois Institute of Technology, the conference had for a theme, "Creative Trends in Structural Design." Speakers turned the spotlight on thin shells of various types, cable-suspended and air-supported roofs and huge sheet aluminum domes. They analyzed newest types of materials—lightweight concrete and metals, reinforced plastics and glue-laminated timbers. They discussed new developments in design methods, such as ultimate-strength design and model analysis and they explored the potential of high-speed electronic computers in structural design.

The problem of building codes was not ignored. Joseph P. Wolff, commissioner, Department of Buildings and Safety Engineering, tackled the question, "Will local building codes permit structures of advanced design?" His answer was that performance-standard type codes, such as the Basic Code of the Building Officials Conference of America, would not bar soundly designed structures. He also stressed the importance of field inspection by the designer, quoting in full the ENR editorial, "No Design Without Inspection" (Nov. 21, p. 128).

• **Forerunners of the future**—Progress made to date with air-supported structures was summarized by Walter W. Bird, president, Birdair Structures, Inc., Buffalo, N. Y. Made of a thin, flexible membrane, these structures are stiffened and stabilized by low air pressure, generally about 0.5 to 1 psi. They are being used for radomes, storage buildings, swimming-pool enclosures and theatres.

Felix Candela, of Cubiertes Ala, S. A., Mexico City, described his newest structures of hyperbolic-paraboloid, thin-shell concrete construction. Included were several long-span cantilevers. He believes the warped shells would be economical in the U. S.

Cable-suspended roof construction was surveyed by Fred N. Severud, of Severud-Elstad-Krueger, New York City. He called attention to the wide variety of forms that could be used for the cable supports.

Mr. Severud said he looked forward to the day when the labels of architects and engineers would be dropped, when the two professions would be mixed and indistinguishable. Then, he believes, we will enter "the millenium when grace and art and beauty will emerge."

The importance, in thin-shell concrete construction, of being able to prefabricate and reuse many times forms and falsework was stressed by Anton Tedesko, vice president, Roberts and Schaefer, New York City. Looking into the future, he indicated the possibility of building a skyscraper out of a thin-shell hyperboloid of revolution.

Elon E. Ellis, vice president, Timber Structures, Inc., Portland, Ore., describing the latest developments in glue-laminated construction, reported that erection would start soon on a 360 ft square timber building with a roof supported on only four columns. Roof trusses will span 280 ft, he said, overhanging the supports 40 ft. Wood folded plates, in line with the truss web members, will act like 27 ft deep girders, spanning between the trusses.

• **New design tools**—Ultimate-strength design for steel and for concrete was portrayed, respectively, by Prof. Lynn S. Beedle, Lehigh University, Bethlehem, Pa., and Erwind Hognestad, Portland Cement Assn., Chicago.

Prof. August J. Durelli, Illinois Institute of Technology showed how model analysis can be used effectively for design of complex structures. Using a "young" epoxy plastic in which stresses are "frozen" during its curing phase, Professor Durelli predicts stresses in the prototype by three-dimensional photoelastic analysis. He described an application to a dam, in which he simulated gravity forces in a 10 ft centrifuge rotated at 400 rpm, but he called attention to another method that could have been used—for example, the immersion of the model in a high-specific-gravity liquid, such as mercury.

World Construction Year Set

A one-day exploratory conference last week at Northwestern University confirmed that the proposed World Construction program (ENR July 11, p. 19) will go ahead.

Some 300 engineers, architects, educators and constructors attended the meeting; and there were donations and pledges of financial aid ranging to $500 to help finance the undertaking during its organizational phase.

As outlined by the temporary chairman of the conference, Howard T. Fisher, Chicago architect and visiting professor at Northwestern, the basic objective of the program is to advance technical progress and sound public relations in the construction industry.

One resolution passed last week urged the three original co-sponsors of the program—Northwestern University, the American Institute of Architects, and the American Society of Civil Engineers—to select leaders in the construction industry to formulate the specific scope and plans for the World Construction program. Another resolution permits the three co-sponsors to accept donations to be used in developing the organization of the program.

As the result of preliminary and informal talks and conferences of interested persons during the past several months, the original plan envisioned the program extending over a five-year period. Next year would be devoted to organization and preliminary planning. During 1959 there would be enlistment of aid from parts of the construction industry—foundations, societies, and trade organizations.

The World Construction Year, 1960, would witness local, national and international regional meetings of all cooperating groups. One of the high points of that year would be the simultaneous initiation in each country of a single large-scale construction project considered of greatest significance and appropriate for demonstrating the most advanced techniques.

During 1961, there would be a World Construction Congress which would review and appraise the activities carried out during 1960. There might also be an International Construction Industry Trade Fair.

The last year of the program, 1962, would be devoted to preparation of reports on all aspects of the construction industry activity. Together, these would comprise the full proceedings of the World Construction Congress in a series of volumes on different subjects.

Merry Christmas

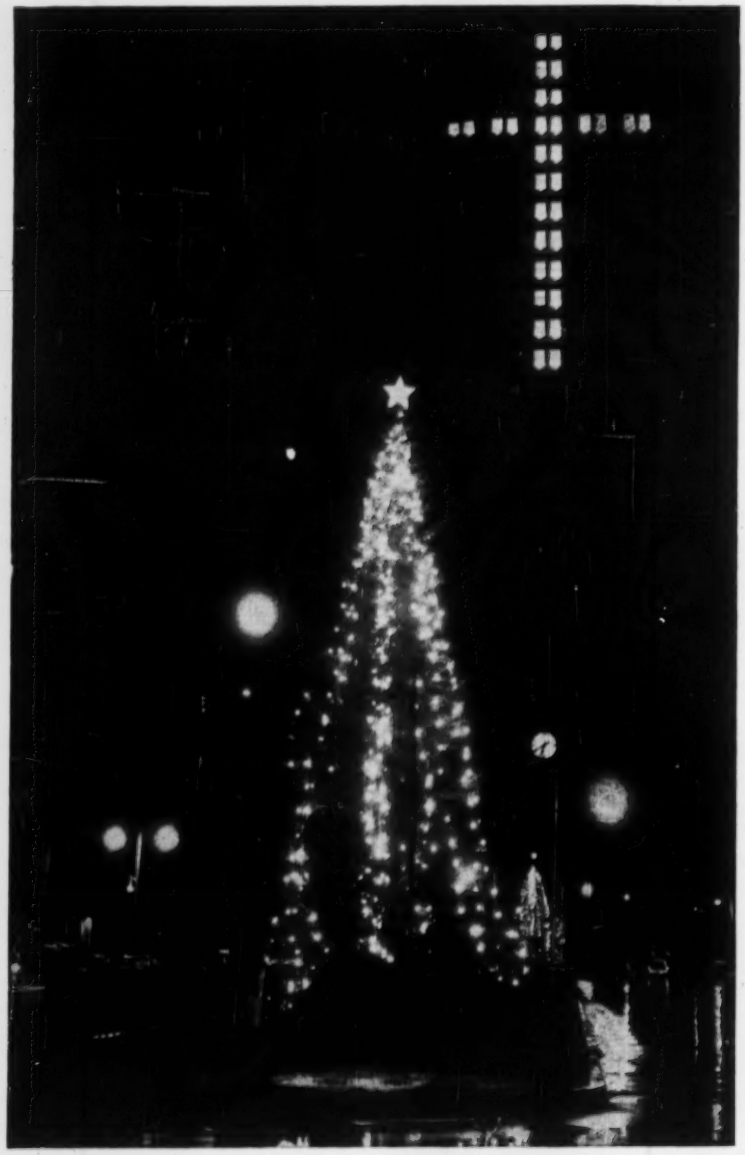
It's Christmas-Tree Raising Time

IN city after city, cranes and crews —which in other weeks are at work on more prosaic construction jobs— took time to raise the traditional community tree. Each year the trees get bigger calling into action hauling, rigging and erection procedures of engineered-construction scale.

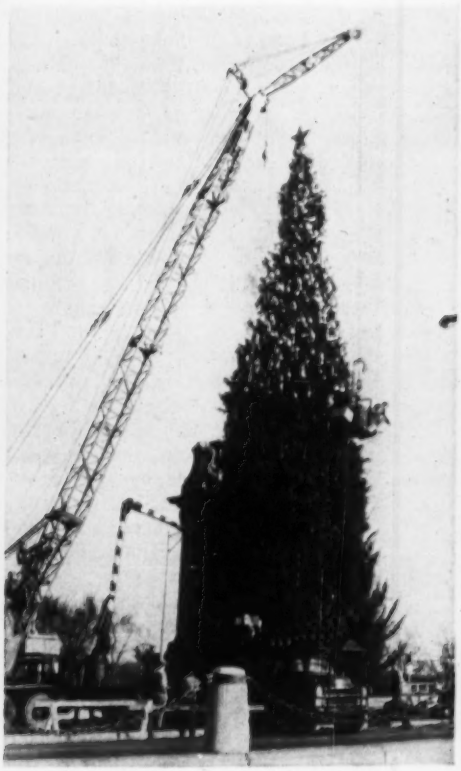
Still, the effort expended on the community trees claims but a fraction of the manpower—and woman and childpower—yet to be expended on the millions of home trees to go up this Yuletide. Wherever the spirit of Christmas exists, this labor of love goes on.

So, whether the tree you trim is big or small, the editors of ENGINEERING NEWS-RECORD take this opportunity to wish you all the good things the tree has come to mean—Merry Christmas a Happy and Prosperous 1958, Peace on Earth, Good Will Toward Men.

WASHINGTON: The nation's big Christmas tree is on the White House lawn.



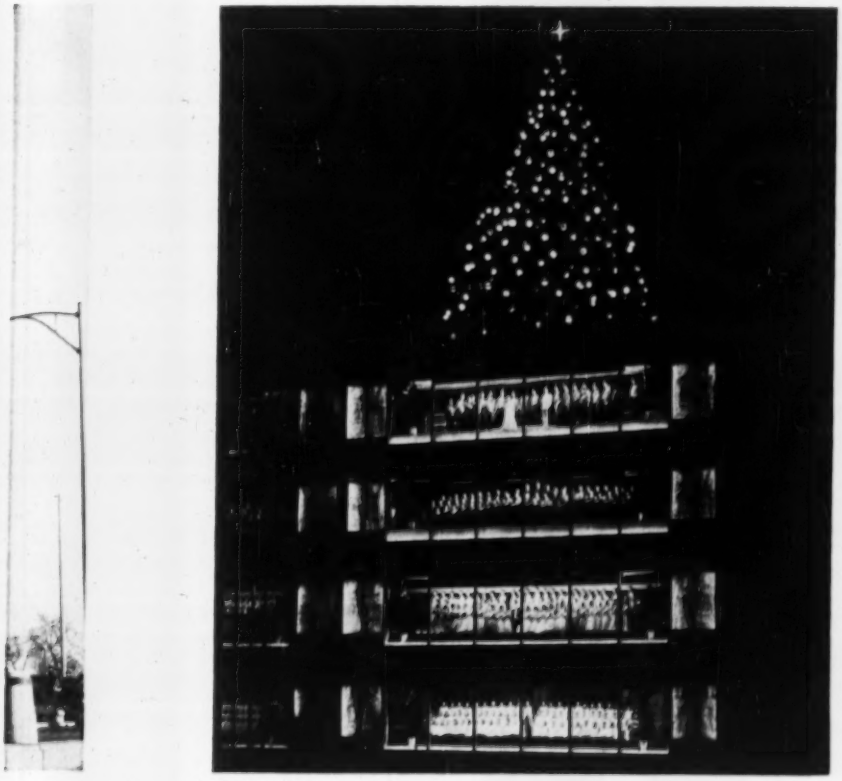
NEW YORK: Park Avenue's trees lead south to the New York Central Building, where lighted windows form the cross.



CHICAGO: A 75 footer is decorated at the corner of Michigan and Congress.

Across the Nation

DETROIT: A 70 ft. balsam was raised on Civic Center Plaza for a ceremonious lighting on December 18.



ATLANTA: This 54-footer on a roof of Rich's Inc. tops a four-story choir-loft during lighting ceremonies.

Lease-Purchase Fails

GSA's revised program fails to attract bidders

The General Services Administration, last week found only two companies willing to provide $22.3 million to finance five of eight federal building projects being offered under a revived lease-purchase program.

GSA had sugar-coated the program by dropping its old 4% interest rate limitation. But the idea drew only two bidders offering interest rates from 4.74% to a flat 5%.

The bidders were Bankers Life Co. of Des Moines, which would finance four of the eight projects offered, and Equitable Life Insurance Co. of Iowa, which bid on only one of them.

"We are not discouraged by the dearth of bidders," a GSA spokesman said. "Nor are we encouraged," he added.

But there was discouragement elsewhere. In Congress, sources in the House Public Works Committee thought the number of bids proved disappointing and predicted there would be a push for the plan of Rep. Robert Jones of Alabama, who wants to abandon the lease-purchase idea. Congressman Jones prefers the direct approach of authorizing money and buildings. All told, some $700 million of needed federal buildings have been proposed under lease-purchase; Jones and others would finance these out of the Treasury as other government buildings are.

For the time being, however, the program is still in GSA's hands.

The criterion which must be applied to the bids is whether they offer the "lowest obtainable reasonable interest rate." Evidently the bids were the lowest obtainable. GSA will decide, after bids on two more projects are opened this week, whether the bidding is reasonable.

Here was last week's bidding:

Bankers Life offered 4.74% on a maximum investment of $5.8 million for a project in Albuquerque, N. M.; 4.97% on $1,690,000 in Council Bluffs, Iowa; 4.97% on $2,100,000 in Kansas City, Kans.; and 4.97% on a $11.5 million investment for a public health service center in Atlanta, Ga.

Equitable Life of Iowa, the only other bidder, offered a bid of 5% interest on $1.18 million for a federal building in Burlington, Iowa.

Projects scheduled for Huntington, W. Va., Green Bay, Wisc., and Omaha, Neb., failed to receive any bids (ENR Oct. 31, 1957, p. 80). The two remaining bid-openings were for federal construction in Abingdon, Va., and Gainesville, Tex.

SUDDEN SLIDE above 72 in. trunk sewer left hole 120 x 200 x 60 ft deep, stretching from lawn to lawn.

QUICKSAND above sewer was stabilized by grout injected from platforms placed by hastily erected cableway. Plastic sheets helped stop embankment erosion from rain.

HOLE was filled with 16,000 cu yd of sand and gravel placed by conveyor supported by cableway. Sewer 145 ft below was plugged with grout upstream of the break.

BYPASS around 3,000 ft tunnel was completed in one week using 42 and 48 in. steel and corrugated metal pipe. Backed up sewage had been relieved through ravine.

Seattle's Sewer Break Posed Challenge

When the ground above a 72 in. trunk sewer tunnel collapsed suddenly on November 13,- (ENR Nov. 21, p. 15) leaving a hole 120x200x60 ft deep, Seattle's city engineer, Roy W. Morse, faced three tough problems requiring speedy decision: Relieving backed-up sewage, stabilizing dangerous quicksand below the hole, and preventing a possible panic among abutting homeowners whose houses would be swallowed up if the hole got any larger.

Sewage which had backed up 40 ft high in manholes was diverted into a nearby ravine while a bypass of the tunnel section was hurriedly constructed. Although the pipeline was completed on Nov. 21, it was not used for another week until a very stubborn sand plug resulting from the cave-in was cleared from the receiving 138 in. sewer downstream of the 72 in. line. This was accomplished by jetting water through holes drilled from street level into the pipe.

Connection of the bypass required a cofferdam to expose the 138 in. line, and, for safety, an interlocking barrier of H-piles driven through the 72 in. tunnel, a brick arch, below the break.

Ground above the sewer break was stabilized with grout and fill. For good measure, a plug was grouted in the tunnel upstream of the break-through holes drilled from street level.

Throughout the hectic two week period, Mr. Morse and staff conducted an admirable public relations program. Residents in the area were contacted personally, newspaper reporters sat in on tense engineering meetings, engineers appeared on TV and the city promptly cleaned up basements and yards flooded with sand-laden sewage.

The sewer in question is a brick arch surrounded by timber shoring that was tunneled many years ago through a glacial deposit consisting largely of sand. The portion in which the break occurred was constructed under air through a quicksand formation.

Best speculation is that the sewer was ruptured some years ago, perhaps during the 1949 earthquake. However, it is fairly certain that the real break occurred last month because no unusual amount of sand ever showed in traps downstream.

Mr. Morse estimates that 10,000 cu yd went down the sewer during the 90 minute slide on November 13.

The city is still studying whether to make the bypass a permanent line or attempt to repair the 72 in. tunnel. The cost of either is estimated at upwards of $500,000.

Austin-Western Hydraulic Crane lowering section of pipe upon a flat bed truck. Superstructure in background is one of the flashing units at Wood River Refinery, Roxana, Ill.

AUSTIN-WESTERN HYDRAULIC CRANE

speeds repairs at Shell's Wood River Refinery

Shell's Wood River Refinery, Roxana, Ill., had six larger cranes, yet in 1955 purchased an Austin-Western for faster handling of 5-ton loads and less.

The company reports: "This crane with its 16-in. tires, four-wheel power steer and four-wheel drive saves time in pulling exchanger tubes and getting around pump houses. With it the men remove heads of heat exchangers, a job that formerly required a large crane, which was more expensive to operate or called for chain blocks which took more men at increasing labor rates. Maintenance men request this hydraulically controlled and maneuverable light crane to lift and transport pumps into the machine shop for repair. It can set a pump right on a boring mill, for instance, without additional handling."

Moves right up to the work. "Being low slung, the A-W goes under the lines in the pipe alleys where larger equipment could not pass. * * * With its 12-ft. extension added to the 18-ft. extensible boom, this crane can remove pump parts through a window section at second story height and later replace them. When a shaft or impeller requires repair in such a location the A-W saves a great deal of hand rigging and consequently many man-hours of time."

Sometimes works around the clock. "Any one of 10 cranemen may be called on to handle the A-W. In the busy season of the year it is sometimes used 7 days a week, right around the clock. * * * It is likely to handle a dozen jobs in 8 hours. * * * New uses for this versatile crane are being [continually] found."

Low cost operation. "The operating cost of this crane is about what other users report for 8 hours' daily use—less than one man's wages."

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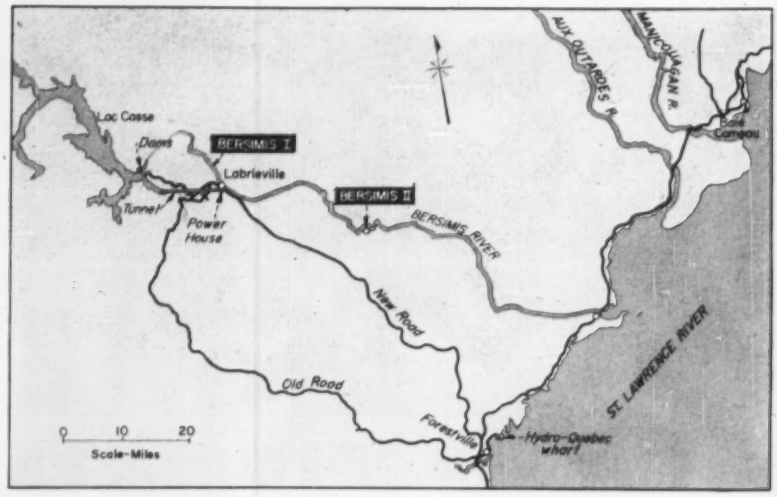
In the Quebec bush . . .

Where Shawinigan has its Rapide Beaumont under construction, Alcan is building the big Chute-des-Passes project, and . . .



Where Hydro-Quebec has two big projects going . . .

with its Bersimis I a nearly completed 1.2 million hp underground powerhouse and Bersimis II an 855,000 hp installation. Together, the two large projects will harness the Bersimis River as it drops to its confluence with the St. Lawrence.

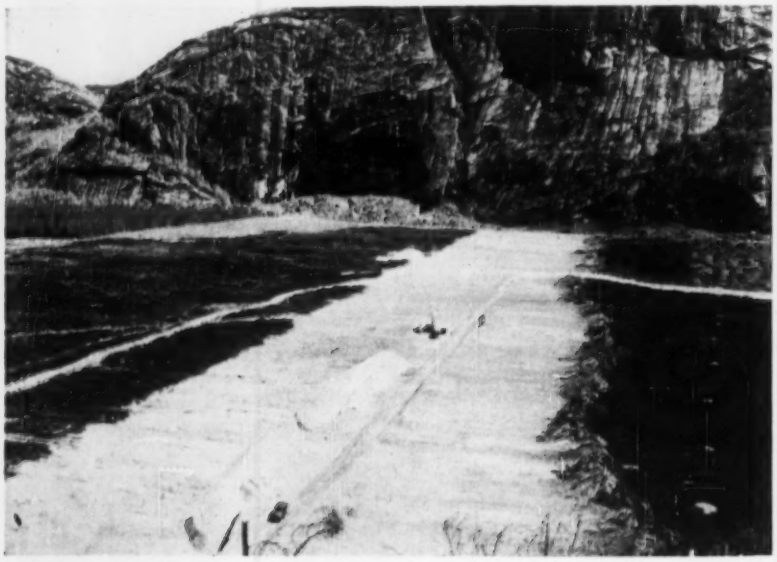
Hydro-Quebec Finishes First and Pushes

Hydro-Quebec, having launched into big construction but a few years back by beginning the first project of a $325 million Bersimis River development, now has that first big Bersimis installation with its transmission lines almost finished and has a second project well started. Together they will total over 2 million hp.

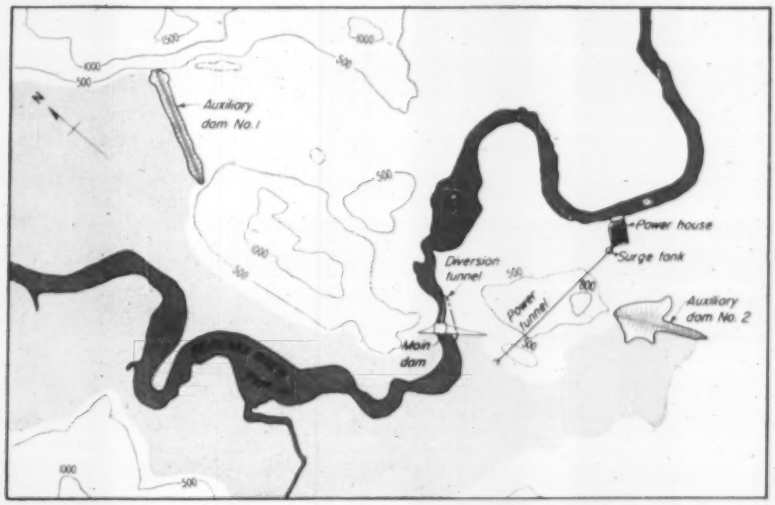
Bersimis I, a 1.2 million hp underground powerhouse that takes water from behind two rockfill dams through a 7½ mi lined tunnel (ENR Nov. 17, 1955, p. 34) now nears completion. With four of its eight units installed and its operating force well established, this project has lost most of its appeal for the few engineers and construction men still there who saw this great kilowatt mining effort start less than five years ago. Some who still live in Labrieville—the picturesquely situated construction camp, now an operators' town—commute downriver to Mile 45, to the more busy Bersimis II.

At Mile 45 on this northshore tributary of the St. Lawrence, the 855,000 hp Bersimis II installation is well under way toward being a five-unit powerhouse, situated alongside a sheer granite mountain, through which a relatively short (2,700 ft) power tunnel will lead waters of the Bersimis River. A 280

HIGH LIFTS (measured by U. S. standards, not Canadian) are 7½ ft in steel forms.



LOW EARTHFILLS are auxiliary or saddle dams of sandy soil and with clay cores. This one is Auxiliary Dam No. 1 on a plateau between sheer granite hills.



Bersimis II is now the number one job.

Its 280 ft main dam is well started, as are the outlying auxiliary dams. Powerhouse and tunnel construction are being pushed as the river's flow is taken past the damsite by diversion tunnel. Shaded area (above) indicates lake to be formed.

Second Bersimis River Job

ft high concrete dam (roughly a million yards) and two earthfill dams will provide storage.

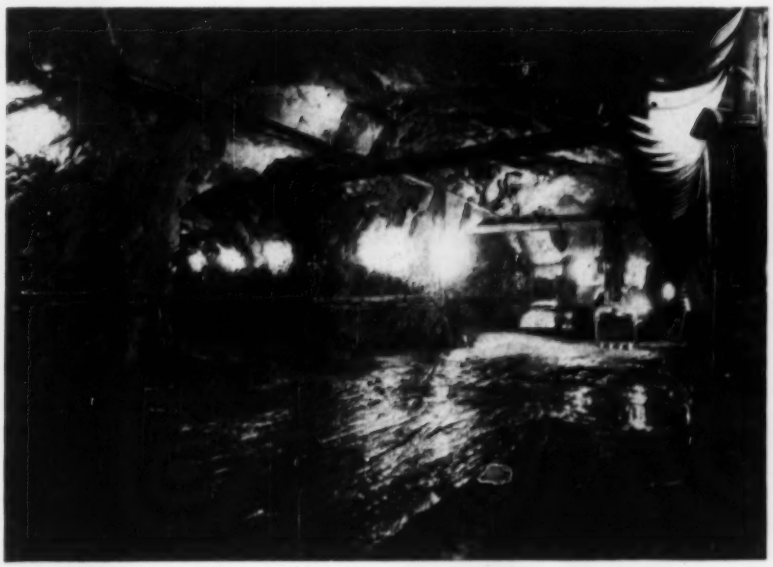
Construction in the season just ended put Bersimis II well past the erection stage and into the production stage on concreting, earthfill and quarrying for concrete aggregate. Now that winter has set in (and winter here can be rugged) concrete production will slow to a halt; emphasis will shift to the 135,000 cu yd of excavation in the power tunnel, which is due to be holed through next April. But before shutting down on mass concrete production, Hydro-Quebec will have placed some 160,000 cu yd in steel forms of the new 7½ ft lifts (used only at Table Rock Dam to date in the U. S.).

• **Contractors manage project**—The $110 million Bersimis II is another project on which the Quebec Hydro-Electric Commission has chosen to contract solely for construction management. As at Bersimis I, all purchasing, deliveries, hiring, payrolls, maintenance and repairs are being handled by Hydro-Quebec itself. The contractors—all three of whom were also at Bersimis I—merely supply the management personnel and their know-how, run the job for a fee plus an incentive percentage. As at Bersimis I, all costs are kept closely in Hydro-Quebec's mechanized accounting office at Labrieville, with both owner and contractor to share in savings under target prices on units established in the contracts.

Perini Quebec has the concrete dam, aggregate production and both the diversion and power tunnels. Komo Construction has the two earthfill saddle dams, the power tunnel's intake channel and the camps and roads. Dufresne Engineering Co. has the powerhouse.

The project managers on this remote project have come to know the advantages and disadvantages of this system of hiring construction management. The fact that both owner and contractors have chosen to repeat the arrangement at Bersimis II is evidence that advantages outweigh any faults with the system.

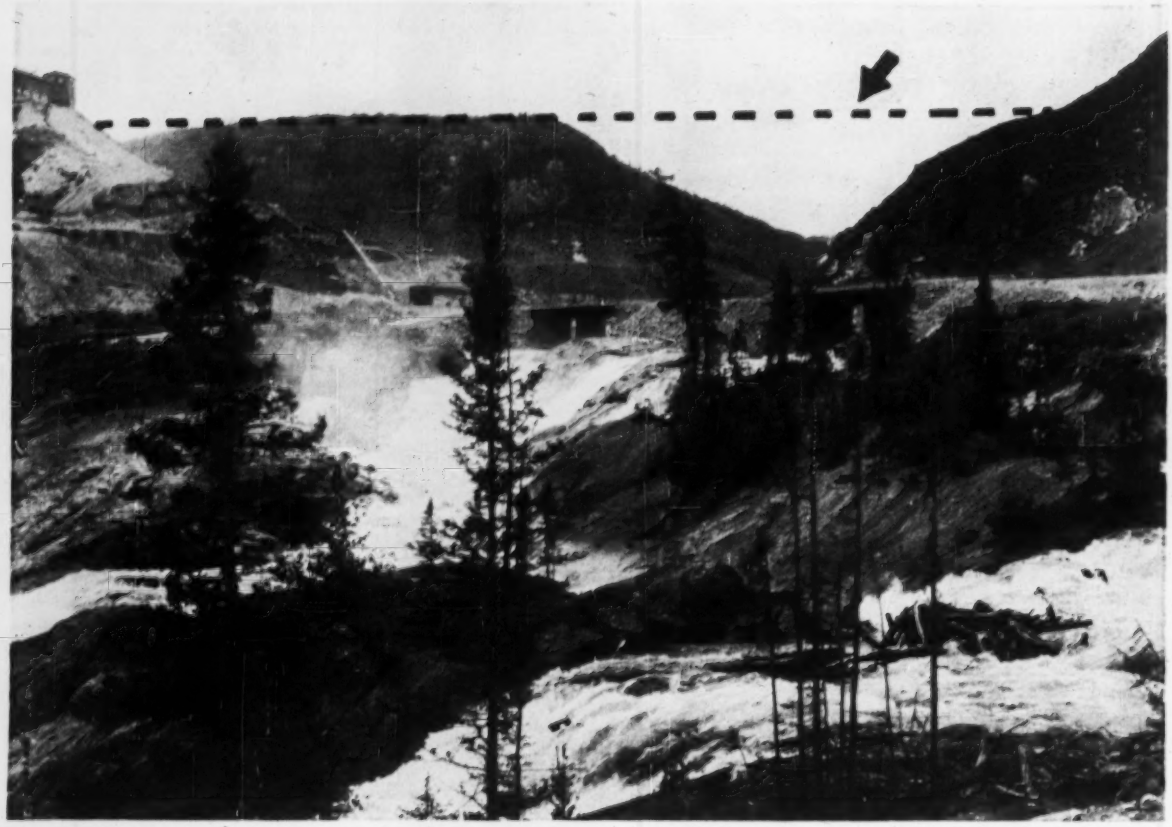
For Hydro-Quebec's part, it is profiting in more ways than one by this system of contracting for management while retaining the accounting and purchasing functions. This Quebec commission—operator of the big Beauharnois plant on the St. Lawrence, plus many other smaller hydroelectric properties in the province—had never built a truly big project from scratch before Bersimis I; it took over most of its exist-



TUNNELED PENSTOCKS take off to the left from the penstock manifold at the downstream end of the Bersimis II power tunnel. There are five units, five penstocks.

OUTSIDE POWERHOUSE is built where penstocks emerge. Bridge carries conveyor.

. . . Second Bersimis project features remote concrete dam



PICTURESQUE SITE of the main dam is marked (arrow) to show future top of the dam now under construction. Powerhouse is to be far enough downstream to develop the head of these falls as well as the head to be created behind the dam itself.

ing power properties when it formed.

Now, with the big Lachine Rapids project on the St. Lawrence River to be built, and the untouched Manicouagan River (among others) still beckoning to the east as potential sources of horsepower in the millions, the owner's engineering and construction management force grows in experience daily in cooperation with its hired construction management at Bersimis II.

• **Easier second time around**—Bersimis II certainly qualifies as what one would call a remote construction project. Yet, it is interesting to note certain contrasts with earlier construction of Bersimis I.

Bersimis I was built from scratch with all materials hauled more than 80 miles from a dock at Forestville on the St. Lawrence. Labrieville developed at the powerhouse site, but the great length of power tunnel called for three additional, outlying construction camps. Roads tying the job together were rough, as was the heavy traffic on them.

Today there is a new road from Forestville—a shorter route, more level, less curved, and with a well-designed gravel roadway. The camp at Mile 45 is not basically different from early camps further up the river, but it is only 22 miles from the now established community of Labrieville, and it is nicely situated on a broad, level plateau that even has room for an airstrip

• **Ideal damsite**—The topography and geology of this area brought advantages, however, that had more vital engineering importance than the favoring of camp location. Through this stretch along its course, the Bersimis drops fast in a solid granite slot between mountains (where the high concrete dam is being placed) and just behind these blocks of granite are vast natural deposits of glacial till, clays and coarse sand (everything needed for the two sizable earthfill saddle dams). And, of course, there is rock practically everywhere to be quarried for concrete aggregate.

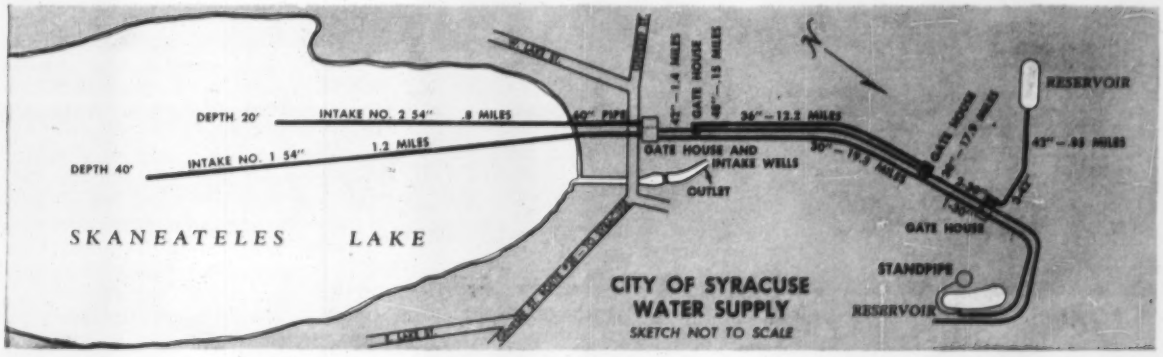
The quarry-site chosen is a sloping face of solid rock into which the drills and shovels will go to take 800,000 tons of rock from three levels. This will be reduced at the nearby 450 ton-per-hour crushing plant to three sizes (5 to 2 in., 2 to 1 in. and 1 to ¼ in.) and trucked downhill about two miles to the river, across a bridge, and from here a 320 ft long conveyor takes aggregate uphill to stockpile below the dam on the river's right bank.

• **Concrete production**—The main concrete plant has two 9,000 ton cement silos and four 2 cu yd mixers to take ingredients from automatic batching equipment. A short electric locomotive (a former Montreal trolley) hauls away 8 cu yd buckets filled at this plant to be lifted by a 25 ton cableway line for placement in the body of the gravity concrete dam.

When in full production, this concreting operation has to place 135 cu yd per hour, 18 hours per day—if Bersimis II is to keep to schedule. They plan to impound water at a ft-per-day rate from May to September of 1959. It is expected that the schedule will permit a shutdown on concreting from Dec. 1 through Apr. 15, this winter and next.

The main dam (280 ft high) will be roughly 2,000 ft long at its crest, with a 310 ft spillway section near its center. Top of dam will be at El. 441. Six 40 ft clear openings will make up the

Underwater intakes laid in '93 and '38 are in "excellent condition" today



Sketch of Syracuse's water supply system. The lake source is about 20 miles from the city. Bethlehem has supplied thousands of feet of tar-enameled steel pipe used throughout the system.

This photograph was taken in 1938, when the City of Syracuse was installing its No. 2 water intake in Skaneateles Lake. Like No. 1, the newer intake consists of 54 in. ID x ⅜ in. steel pipe joined into sections on shore, floated to position, lowered to the lake bottom, and connected by divers. Intake No. 1 measures 6419 ft; No. 2 is 4213 ft long.

The 1938 intake pipe was supplied by Bethlehem in 30-ft lengths. It was coated and lined with modern spun coal-tar enamel, a big improvement over the asphalt coatings used on the older line which was installed back in 1893.

Here's what the City's Division of Water reports: "Inspections of the exterior of the intakes by divers indicate that both are in excellent condition today."

Similar reports from all parts of the country make it clear beyond doubt that tar-enameled steel pipe, properly installed, will give excellent service and long life under the very toughest conditions.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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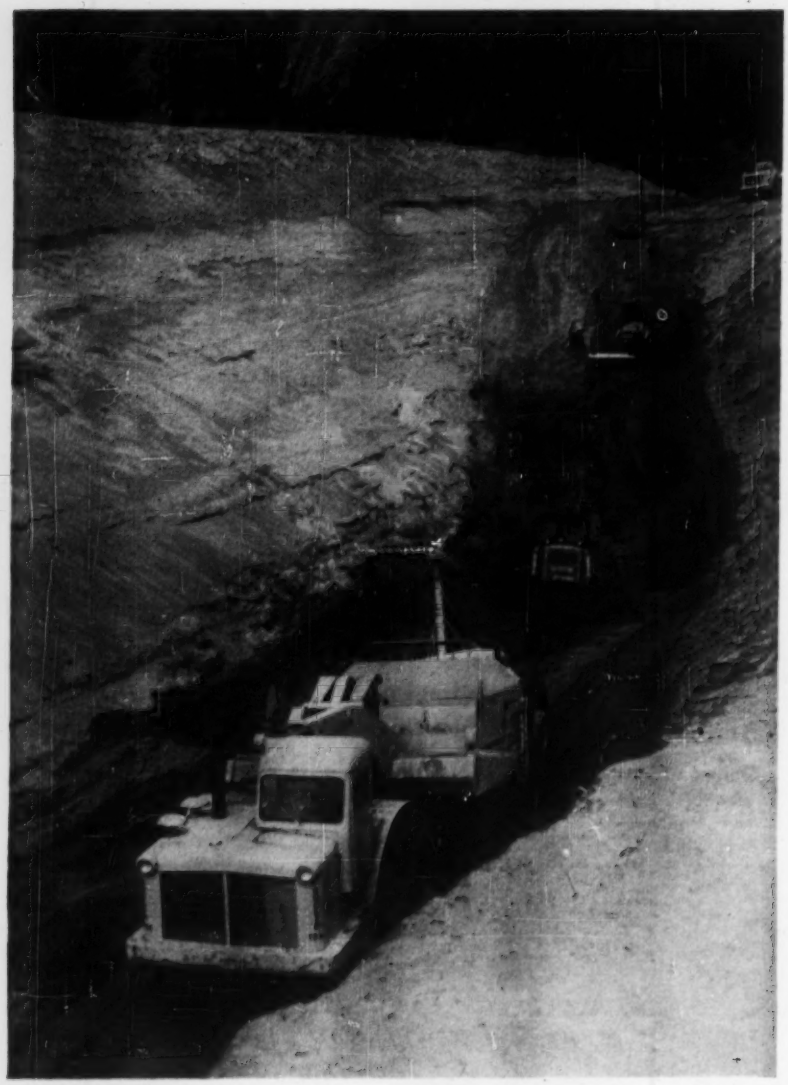
BETHLEHEM STEEL

. . . Bersimis II: Dams, tunnel, powerhouse



BIG SCRAPER places clay core in the larger auxiliary dam. Two of these 27 cu yd rigs each have moved 150 cu yd per hour over the short haul from pit to dam.

spillway, with 10 ft piers between. A 14 ft roadway atop the dam will bridge the spillway openings. And vertical gates will close these openings to control flood flows over the dam and down into its spillway bucket.

In addition, a 15 x 33 ft diversion culvert will pierce the dam to the left of its spillway at about El. 234.

The diversion tunnel through which the river now flows will be plugged, of course. This 800 ft diversion tunnel of 31 ft lined diameter was mined under the right abutment of the dam to carry river flows that will average 7,000 cfs and range up to 30,000 cfs during the four year construction period. It is a horseshoe section with a 15 in. concrete lining.

• **Earthmoving**—The project's two earth dams are relatively small, straight forward structures. Dam No. 1 is to be 45 ft high, 3,300 ft long and 1 million cu yd in volume. Dam No. 2 will be 33 ft high, 3,900 ft long and 500,000 cu yd. Each will have a 12 ft wide clay core at its center, sloping downstream into a cutoff trench. In some places, a fine sand blanket extending upstream will give these earthfills added impermeability.

Komo Construction Co. hauls clay and coarse sand from right nearby each dam (they have three 27 cu yd scrapers in the earthmoving fleet). No haul exceeds two miles in length, and the big scrapers make 150 cu yd per hour per machine on a flat 4,000 ft haul.

An October, 1958, completion date on both earthfill dams is expected to be attained quite easily.

• **Tunneling**—The 41 ft 4 in. dia power tunnel being mined is to be circular with a 1 ft 8 in. thick lining. It will drop at 30 deg from the horizontal for its first 500 ft, then at a 5% grade for about 1,500 ft, and finally at 0.5% for its last 700 ft or so.

The penstock manifold will be the same circular section as the tunnel, but the five horizontal penstocks that take off from it are 20 ft 2 in. horseshoe shapes into which circular steel liners will be installed.

Just ahead of the penstock manifold there will be a 300 ft high vertical surge shaft to the ground surface above. It will be mined to 37 ft and lined to 33 ft dia, and will be topped with a 100 ft dia, 100 ft high steel tank.

• **Powerhouse**—The powerhouse at Bersimis II will not be underground as at Bersimis I—but very close to it. Its substructure will be set deep in a rock excavation and all five penstocks to the five 171,000 hp units will emerge from tunnels right at the powerhouse wall. The completed structure will, indeed, have a near-vertical mountain side as its one long wall. Its opposite wall will face the river. No tail race excavation will be required.

These five Francis type turbines at Bersimis II will be bigger than Grand Coulee's. But, as it has been reported (ENR Nov. 14, p. 52), the five 200,000 hp units to go underground at the relatively nearby Chute-des-Passes will top anything on this continent. (Stornorrfors in Sweden will equal the 200,000 hp.)

Construction of the Bersimis II powerhouse has been distinguished by a 590 ft suspension bridge, built to belt-convey aggregate to the batching and mixing plant (two 2 cu yd mixers) that will produce all concrete for both powerhouse and tunnel lining. Pumpcrete machines will be used in the tunnel, penstocks and surge shaft when lining starts next spring.

Bersimis II had some 3,600 men working before winter arrived. Its peak force next spring will be about 4,000. (Bersimis I employed 5,000.)

• **Management**—The project managers for the three contractors are: Al Cummings for Perini Quebec, Inc.; Louis Bourbeau for Komo Construction, Ltd.; and S. Revay for Dufresne Engineering Co., Ltd. For Hydro-Quebec: Francois Rousseau is chief engineer of the Power Development Division; Clement Forest in general superintending engineer of construction for the division. J. O. Parker is project coordinator.

Here's the torque converter equipped HD-16 on the job at Tyrone Rock Quarry, located south of Atlanta, Georgia. The torque converter was the reason this firm picked the HD-16.

"Why did we buy the HD-16? Because of *torque converter drive!*"

says Pete Bradberry, Tyrone Rock Products Company

When Tyrone Rock Quarry needed a new track-type tractor, company officials made no bones about one feature the machine had to have—namely, a torque converter drive.

As Superintendent T. J. (Pete) Bradberry describes it: "We bought the Allis-Chalmers HD-16 because of the *torque converter drive.* We find the torque converter automatically matches speed and pull to load requirements and terrain conditions. Under full throttle, the engine doesn't lug down, but instead delivers maximum horsepower at all times. It saves wear and tear and is worth many times the price!"

Torque converter drives prove ideal for such applications as rock quarry work . . . for stripping overburden, stockpiling and maintaining roads. They speed work and save operating costs. They permit engines to operate in their most efficient speed range at all times . . . They match power automatically to load demands . . . providing up to 6:1 torque multiplication when required. Heavy load pick-up is smooth and even, without clutch slippage . . . for better over-all flotation.

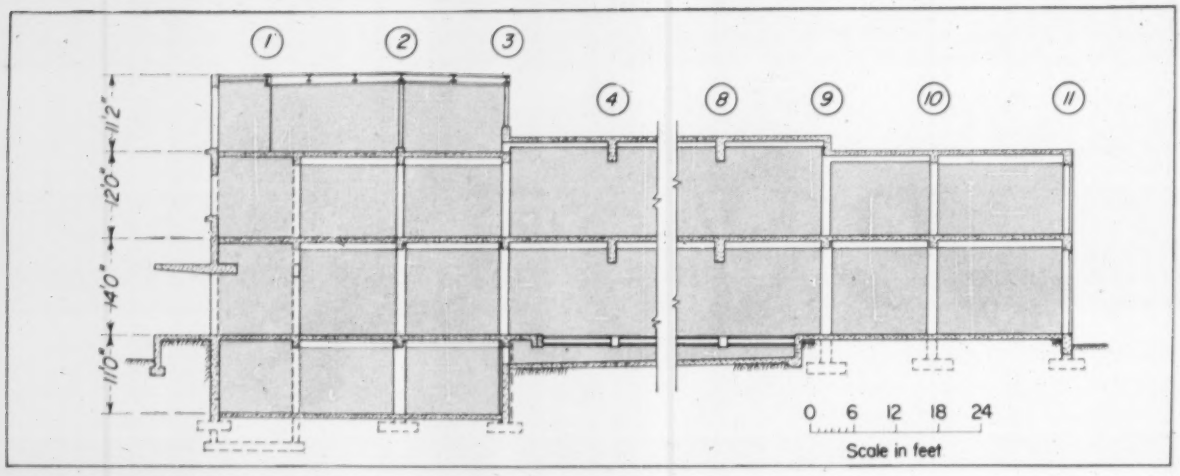
Allis-Chalmers offers a torque converter as optional on the HD-16 Tractor and as standard equipment on the bigger HD-21. In either case, the converter components are furnished by Twin-Disc—your assurance of dependability.

All three of the leading track-type tractor manufacturers offer torque converter drives as optional or standard in certain models . . . and all three standardize on Twin Disc components. Be sure to specify a torque converter in your next machine. See for yourself how they cut costs, bring in new profits.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois



REINFORCED CONCRETE BENTS, 11 panels long, that support 100 x 200 ft building, were analyzed by moment distribution method in an electronic computer. Twelve such bents, six for each two stories, were processed in the computer on this pioneering job.

Building Frame Analyzed by Computer

E. S. Brandon
Structural Engineer
W. C. Kruger & Associates
Santa Fe, New Mexico

The frame of a two-story reinforced concrete building designed by the author's firm was analyzed in an electronic computer utilizing a moment distribution method. Appropriately, this 100x 200 ft building frame is for a structure that will house two computers.

An article in ENGINEERING NEWS-RECORD (May 23, p. 66) describing pipeline network analysis by electronic computer using a converging approximation (Hardy Cross) method prompted the thought that the computer should be able to distribute moments as capably as it could water flow. After all, the method of converging approximations was originally developed for structures.

Consultation with the Datics Corp. of Forth Worth, Texas, a computer service organization, indicated it would be possible to develop a computer program that would analyze building frames as readily as water loops. After looking into the problem, the computer firm expressed some concern as to sign conventions (i.e., positive or negative moments) in the final design presentation. This led us to adopt a modified moment distribution system (developed by Prof. L. E. Grinter and standardized by the Portland Cement Association) which records signs automatically.

The building in question was being designed for the Albuquerque District of the Corps of Engineers on a rush basis. It was conceived as a reinforced concrete frame with two-way floor slabs. We thought it would be possible for a computer to analyze each of (twelve) 11-panel bents in the structure (columns mainly on 20 ft centers) and produce final bending moments and shears in beams and columns and areas of reinforcing steel required.

The Corps was intrigued with our attempt and even sent a structural engineer with us to Fort Worth to assist in preparing a computer program. As now established, the program requires as input data for a complete bent the stiffness (K) factors for all beams and columns, fixed-end moments, uncorrected shear in each beam plus concrete design data and dimensions—as shown in the accompanying box. Although the computer could supply the fixed-end moments and shears, given the loads involved, it was felt these data should be determined manually by the design engineer. His judgment is required for unusual loadings, or complicated ones such as attendant with two-way slab design in this project. Of course, regardless of whether design is by computer or slide rule, column and slab sizes have to be estimated.

Programming of the problem was fairly complicated, primarily because of carry-over factors and distribution and the necessity of rechecking estimated sizes of individual members in the computer. Extensive use of the machine's storage or memory, was required.

What Goes Into Computer, What Comes Out

Input to computer (furnished by design engineer)

- Negative fixed-end moments for dead loads on all spans
- Positive and negative fixed-end moments for total loads on all spans
- Stiffness factors for all columns and beams
- Estimated size of beams and effective depth (b, D and d)
- Concrete data (f'_c, f_c, k, j, and f_s)
- Span of beams, width of columns
- Theoretical shear at ends of beams

Output from computer (automatically printed out)

- Stiffness ratios (stiffness of member over sum of stiffnesses of all members)
- Theoretical moments after carry-over and distribution (iterations continued to predetermined accuracy)
- Actual shear at each end of beams
- Unit shear at each of beams
- Negative design moment at end of beam
- Positive design moment at center of beams
- Required depth of beams if check reveals assumed effective depth is short
- Area of negative steel required (based on assumed effective depth if adequate or new required depth)
- Area of positive steel required (based on assumed or new effective depth)

. . . Computer for structure

• **Results**—As shown in the accompanying box, the computer supplied corrected design moments for all members (including reduction for columns), corrected shears and the area of positive and negative steel required in beams. The computer checked size of each member for compressive strength prior to designing the reinforcement. If assumed size was adequate, the computed designed steel for the assumed size (although it could design exactly to size, this was not done to retain uniformity in beam sizes). If the estimated size was inadequate, the computer automatically found the required depth and designed steel accordingly.

• **Computer economics**—It was not expected that the cost picture for this experimental application of computers would be as attractive as some highway engineering firms are reporting. And this was the case. We paid Datics Corp. $250 for the complete frame design based on computer time plus double this for the programming fee. The same calculations performed manually would have taken ten man-days of competent engineering time. So not including the programming cost, a small cost saving was achieved. The program cost will be amortized over many future projects.

However, monetary savings, in our estimation, is secondary. Jobs of a similar size can be accomplished in three days of elapsed time (including mailing to Fort Worth). More manpower will be available for other projects. And mathematical errors that are apt to occur in repetitive processes of this nature are completely eliminated, together with the ennui that is often a part of this procedure.

The moment-distribution program now prepared is very flexible and can be used for almost any concrete frame that can be analyzed by the moment distribution method. It can readily be adopted to continuous steel frames by introducing the proper stiffness factors and fixed-end moments.

After working on the development of this structural engineering program, the author is thoroughly convinced that almost any problem in structural design can be solved by the computer with advantage. One of the most interesting facets of the machine is its insistence on basic formulas; no shortcuts and handbook approaches are permitted in its mechanical mind. After years of utilizing almost every conveivable labor-saving design device, this experience was really a refresher course in the basic concepts of reinforced concrete design.

The author predicts a bright new era for the competent, but lazy, structural engineer.

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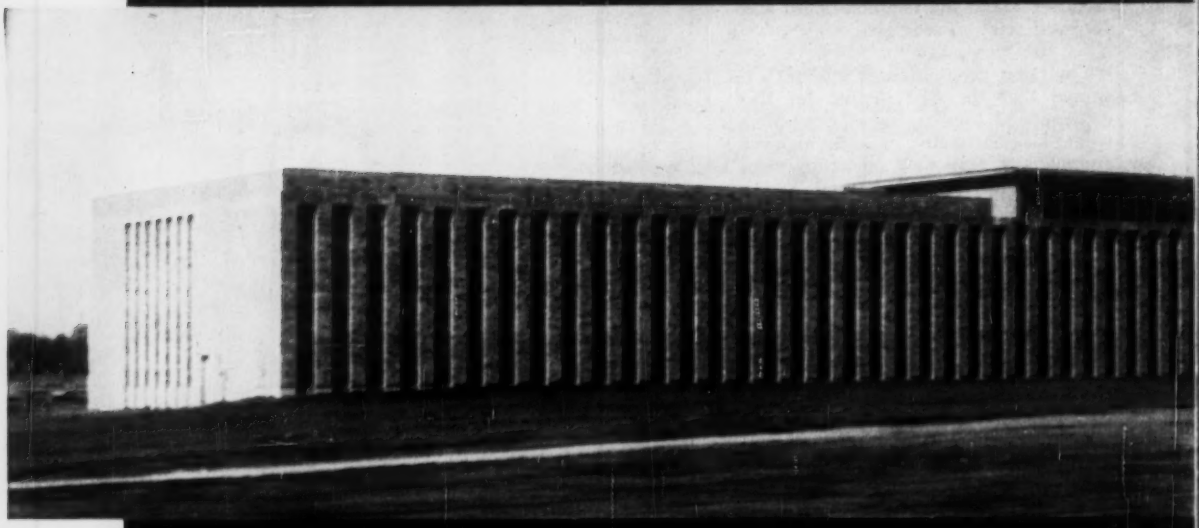
Administration Building, where Ceco curtainwall was used to give solid pattern appearance, yet balance with varying treatments in other areas.

Saint Xavier Library, example of vertical and horizontal construction tastefully blended. Ceco windows on left are 1½" steel heavy intermediate projected; on right, aluminum projected. Air is deflected upward, allowing controlled ventilation.



Saint Xavier College, Chicago, where Ceco windows and curtainwalls were used to dramatize seven separate buildings: administration, classroom, convent, science, gymnasium, library and service. Architects and Engineers: Naess and Murphy. Contractors: E. H. Marhoefer, Jr. Company.

Convent Recreation Room under construction. Ceco longspan open-web steel joists allow great flexibility in arrangement of partitions and fixtures ... eliminate interior columns. Workers are installing Ceco steel casements and steel picture windows in prepared openings.

Classroom Building, center, illustrates how Ceco windows (aluminum projected, in this case) are used with masonry wall construction without disturbing the predominant curtainwall pattern.

HOW TO FIT THE BUDGET TO THE BUILDING

WITHOUT CHANGING THE ARCHITECTURAL CONCEPT

Building plans can change if materials cost too much. But the original building concept needn't change. For engineers can select from Ceco's range of products to meet any building budget . . . any building requirement. When savings were needed in the new Saint Xavier College for Women, the engineers asked Ceco to recommend economies in window and curtainwall construction. Ceco's product development supplied the answer. The school's seven units were enclosed without changing the basic architectural and engineering designs. Strength, long life, easy maintenance and beauty were maintained. Ceco offers its engineering background to engineers and contractors everywhere for the economical construction of wall enclosures—floor framing, too. So call your nearest Ceco district office for help on your next building project. Ceco Steel Products Corporation—general offices: 5601 West 26th Street, Chicago 50, Illinois—offices, warehouses and fabricating plants in principal cities.

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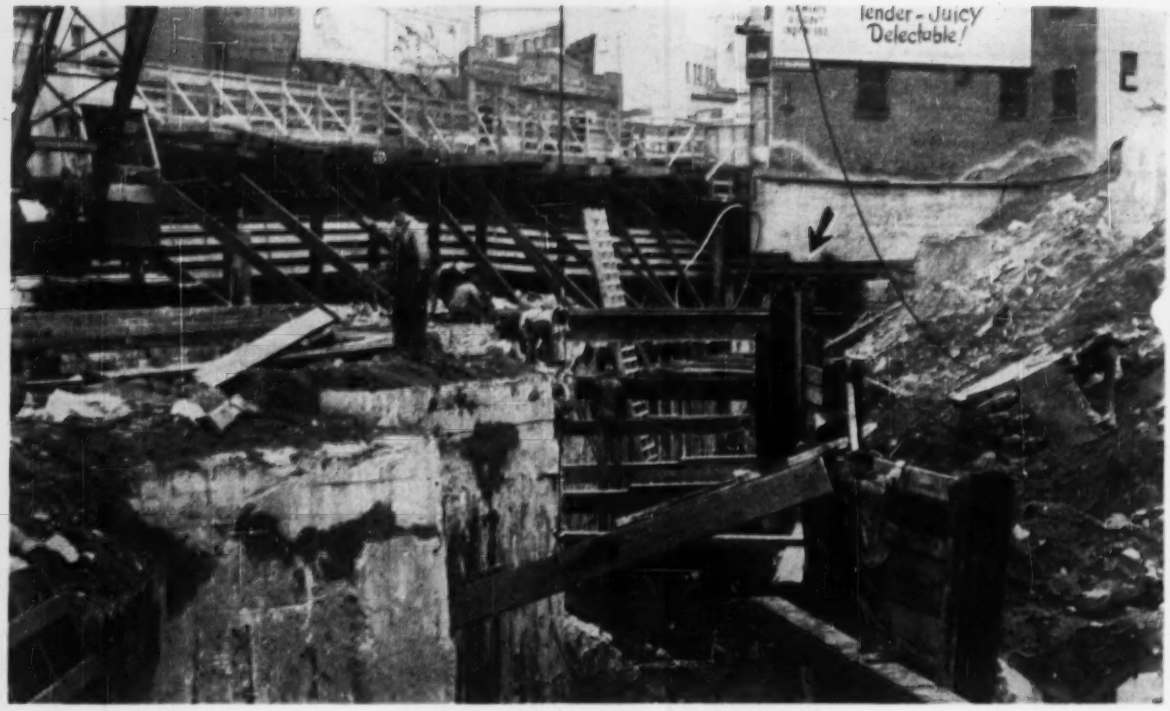
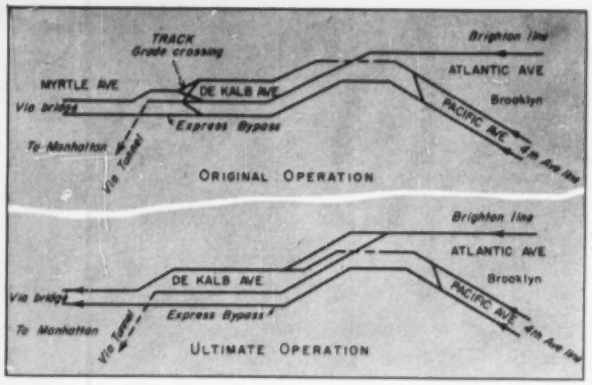
ENR



Reconstruction of a mile-long stretch of Brooklyn subway is a test of contractor ingenuity. Trains continue to move while underpinning, excavation and steel erection are carried out. Some 41 adjoining buildings must be underpinned (arrow).



IMPROVED OPERATION of new system will result from eliminating track grade crossings and adding new trackwork.

Load Transfer Is Key to Subway Job

Reconstruction of the New York City Transit Authority's BMT subway division tunnel at the DeKalb Ave. station in Brooklyn without disrupting the flow either of subway or surface traffic is proving a ticklish construction job.

Probably the biggest single difficulty is in meeting the existing steel structures with new beams, then switching tracks and removing old steelwork without interfering with train traffic. In fact, in some sections, both new and existing structural steel must be temporarily supported before the final structure can be built.

Additionally, the contractor must underpin 41 buildings, several manholes, an elevated line's trestle and a long stretch of adjoining subway during excavation and construction.

The job is a contractor's nightmare.

• **Purpose of project**—When completed the project will eliminate track grade crossings that tie up train traffic—especially during rush hours.

This stretch of subway is one of New York's busiest.

During the rush hours, delays of up to 10 minutes occur as trains wait, backed up on long stretches of track, while complicated switching and crossing maneuvers are carried out.

The present system, which handles an average of 72 trains per hour in each direction, consists of two main lines to the DeKalb Ave. station from Brooklyn.

From this station the lines again branch, one leading to Manhattan via the Montague Tunnel under the East River, the other via the Manhattan Bridge. An average of 29 trains per hour are routed via the tunnel, the rest crossing the river via the bridge. In this operation some of the express trains by-pass the DeKalb Ave. station to move directly into Manhattan.

The big bottleneck occurs in a crossover at DeKalb Ave. where trains routed through the tunnel must cross the tracks of trains routed via the bridge. With elimination of this crossing and addition of new tracks the capacity of the system will be increased to 90 trains per hour in each direction.

This will be eliminated when the subway is widened, new track is installed and grade track crossings are eliminated in the reconstructed section.

(*Continued on page 40*)

ADEQUATE SHOULDERS: Key to greater highway safety and service

BITUMULS® DM-1 is applied by distributor.

BITUMULS Base Stabilization of Shoulders on New Jersey Route S-41

FIRST PULVI-MIXER follows closely behind distributor.

PNEUMATIC ROLLERS in tandem on initial compaction.

MC-1 CUTBACK PRIME applied ahead of final seal.

● Typical of the speed and ease with which new safety and service can be built into existing highways is the work done last August along an eight mile stretch of Highway Route S-41, near Ellisburg, N. J.

Along each side of the 20 foot, rigid type pavement, a 10 foot width of sand-gravel base, 4 inches deep, had previously been placed and compacted to provide drainage. But it lacked stability, both under moving traffic and parked vehicles.

CONSTRUCTION METHOD

This in-place material was scarified, then bladed level. Over the loose scarified material, Bitumuls DM-1 was applied in two applications. Following each application, the material was mixed with two Pulvi-Mixers operating in tandem.

After mixing, the material was cut back to an even sub-grade line, then re-spread uniformly over the full 10 foot width. During blading and spreading, the mix had aerated sufficiently to allow immediate compaction. Pneumatic-tire rollers were used for initial compaction, with a final pass by tandem steel-wheel rollers.

This stabilized base was allowed to cure for one week, then surfacing proceeded as follows:

MC-1 cutback prime applied at the rate of 0.25 gal. per sq. yd. $\frac{3}{8}$" traprock applied over prime at the rate of 25 lbs. per sq. yd. Bitumuls RS-2 applied at the rate of 0.25 gal. per sq. yd. $\frac{3}{8}$" traprock again applied at the rate of 25 lbs. per sq. yd.

The shoulders were then thoroughly rolled.

In addition to holding costs to a minimum by making use of in-place material, Bitumuls Base Stabilization provides a fast, simple method of extending the service and safety of existing highways. *Full details on this method of shoulder construction are available from our office nearest you.*

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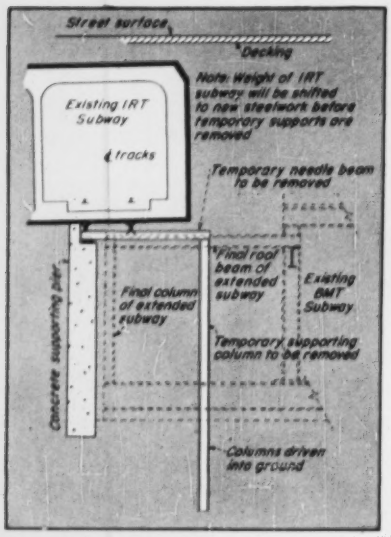
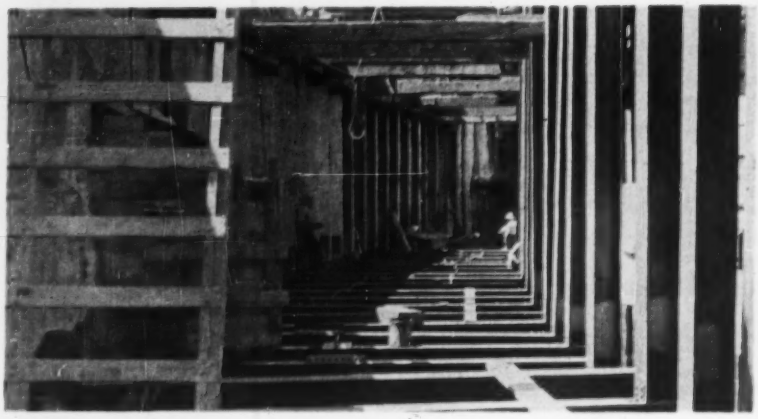
. . . Underpinning techniques


Street surface
Decking
Existing IRT Subway
4 tracks
Note: Weight of IRT subway will be shifted to new steelwork before temporary supports are removed
Temporary needle beam to be removed
Final roof beam of extended subway
Existing BMT Subway
Final column of extended subway
Concrete supporting pier
Temporary supporting column to be removed
Columns driven into ground

ADJOINING SUBWAY is underpinned for a distance of 200 ft by supporting it with temporary needle beams during construction. Permanent steel subway structure will take load after new tracks are in use.

WOOD SHIELDING protects existing subway tracks from work being done on other side as masonry is removed and new steel erected.



NEW STRUCTURE takes shape on opposite side of shielding as trains continue normal operation on existing tracks. New tracks will be laid later.

• **Excavation problems**—The first step of the project—begun in the spring of 1956—was to drive soldier beams at the limits of the new construction to brace wood lagging that would support the earth pressure and the temporary roadway decking. Lagging of thicknesses from 4 to 8 in. was placed behind the soldier beams as clamshell shovels went to work.

To minimize surface traffic tie-ups, small areas were excavated from the street, by clamshell and by hand as necessary, until finally 12 x 12 in. wood decking laid on heavy steel girders was extended across the excavated portion to restore the street.

Such was the pattern then: drive soldier beams, excavate, lag lay girders and decking. Much hand excavation had to be done to avoid damaging or disturbing any of the vast labyrinth of electrical conduit, telephone cable, water mains and sewer lines.

Since trains had to move unimpeded throughout the construction process, the contractor had to protect the existing trackwork with fireproofed wood shielding before he could break masonry or erect any new steelwork.

The new construction thus is in most cases being carried out in an isolated chamber, with shielding and lagging making up the walls and wood decking the roof.

• **Underpinning buildings**—Some 41 buildings on the route had to be underpinned to assure adequate foundation. In many cases the old buildings are completely outside the construction area, yet because of proximity they had to be underpinned. A few of the buildings actually cantilever over the new excavation—a situation that led to more complicated underpinning techniques.

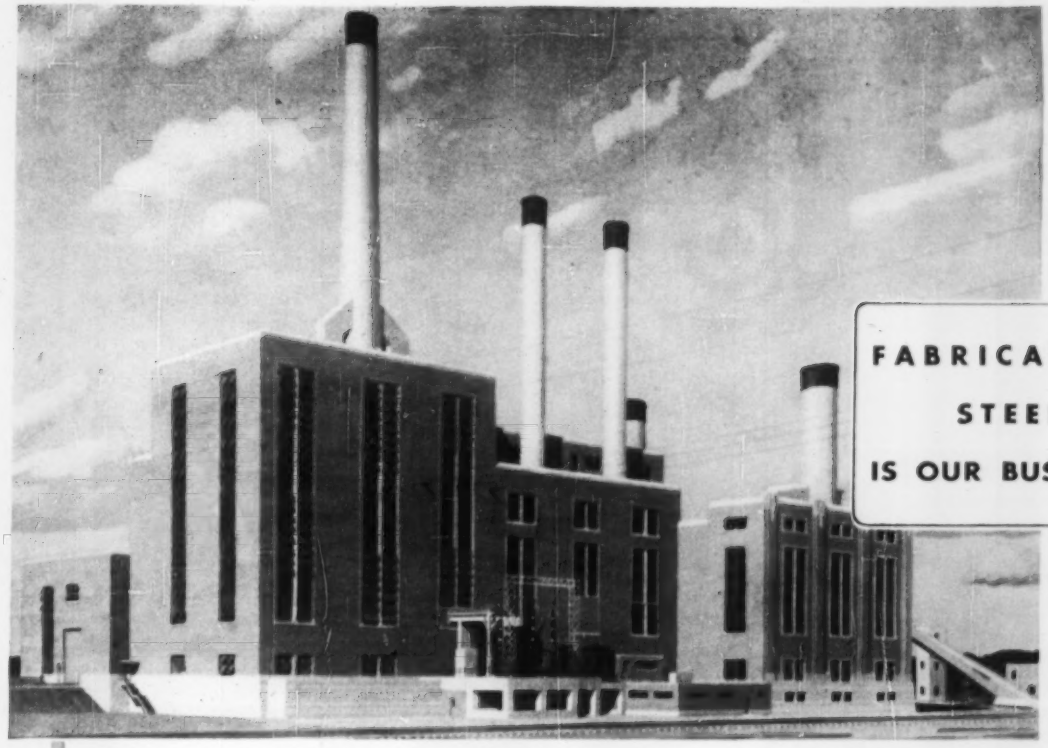
In the simpler operations, 4 x 6 ft pits are dug at intervals along the foundation wall to be supported. They extend to the base of the foundation, where lateral cuts are made to reach under the structure. Then, the contractor digs vertically again, beneath the building foundation to a depth dependent upon the size and location of the building with respect to the excavation. The excavation beneath the foundation then is filled with concrete, which acts as a pier support of the building.

In the more complicated underpinning work, in which the building actually cantilevers over an open cut, needle beams must be inserted under the foundation to carry the load to beams and columns in the excavation. These are in addition to the conventional concrete piers that are formed in all types of underpinning.

To underpin three of the older buildings along the line would have been so expensive that they were, instead, condemned and demolished. When the project is completed, new buildings can be erected at the site of the old ones, providing special foundations are designed.

• **Underpinning a tunnel**—One of the toughest jobs was the need to support an adjoining subway tunnel while the excavation proceeded beneath it to extend the BMT line. About 200 ft of an adjoining IRT division tunnel is undercut by the new extension, so that it cantilevers over the new work.

Again, underpinning was done by extending needle beams under the IRT, supporting these on temporary beams and columns, and digging pits for concrete piers at intervals to act as temporary supports. Then, when the new beams are permanently tied into the existing BMT subway's steelwork, the IRT load will be shifted to the new



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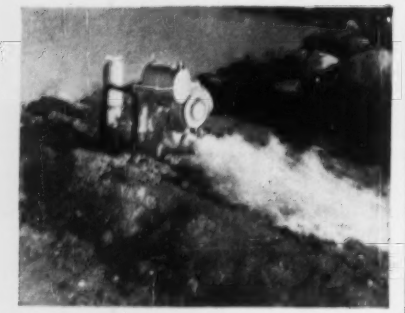

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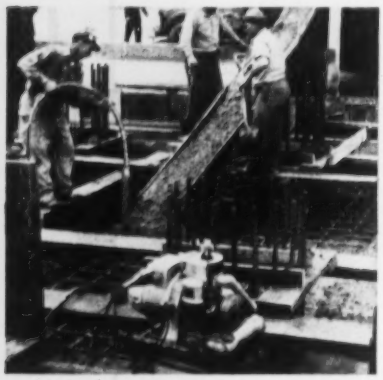

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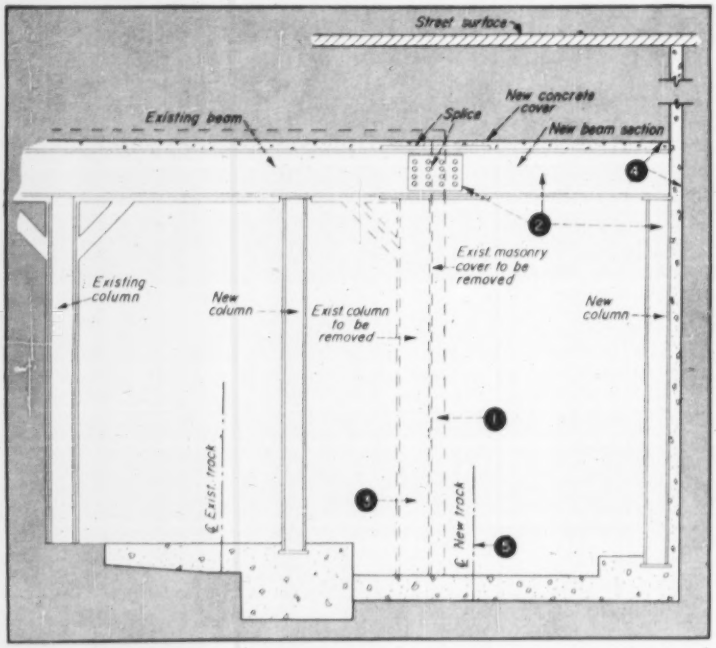
. . . Beam splicer used to widen subway



SPLICING BEAMS to new steelwork requires careful sequence of operations to assure uninterrupted train traffic. After soldier beams, lagging, and shielding is in place and excavation has been completed the following steps are taken in constructing this typical section: (1) Masonry is broken from existing subway wall. (2) New steel is set and spliced to existing roof beams. (3) Old steel is removed and splice is completed. (4) New subway wall and roof are concreted, duct lines built, and new cables installed. (5) New tracks are installed and traffic transferred.

steelwork and the temporary supporting steel cut out. The adjoining tunnel then will be supported in part by concrete piers and in part by the new steelwork.

In addition to supporting buildings and subway, the job has called for several temporary supports of existing manholes. Often this has been done by hanging the structure from above, or by supporting it on temporary steelwork below. In all cases care has to be taken—when switching the load from temporary steel framework to permanent—that such steel actually is ready to take its load.

A final underpinning job was that of a trestle of the Myrtle Ave. Elevated line. Again, this was done by transferring the load through a steel framework to an elevation below the subway's subgrade. The load was then shifted to the roof of the new subway structure when it was completed.

In shifting the loads from temporary to permanent supports, a careful sequence of operations must be followed.

• **Tying in new steel**—Trickiest part of the whole job lies in tying in the new steel without interrupting the trains.

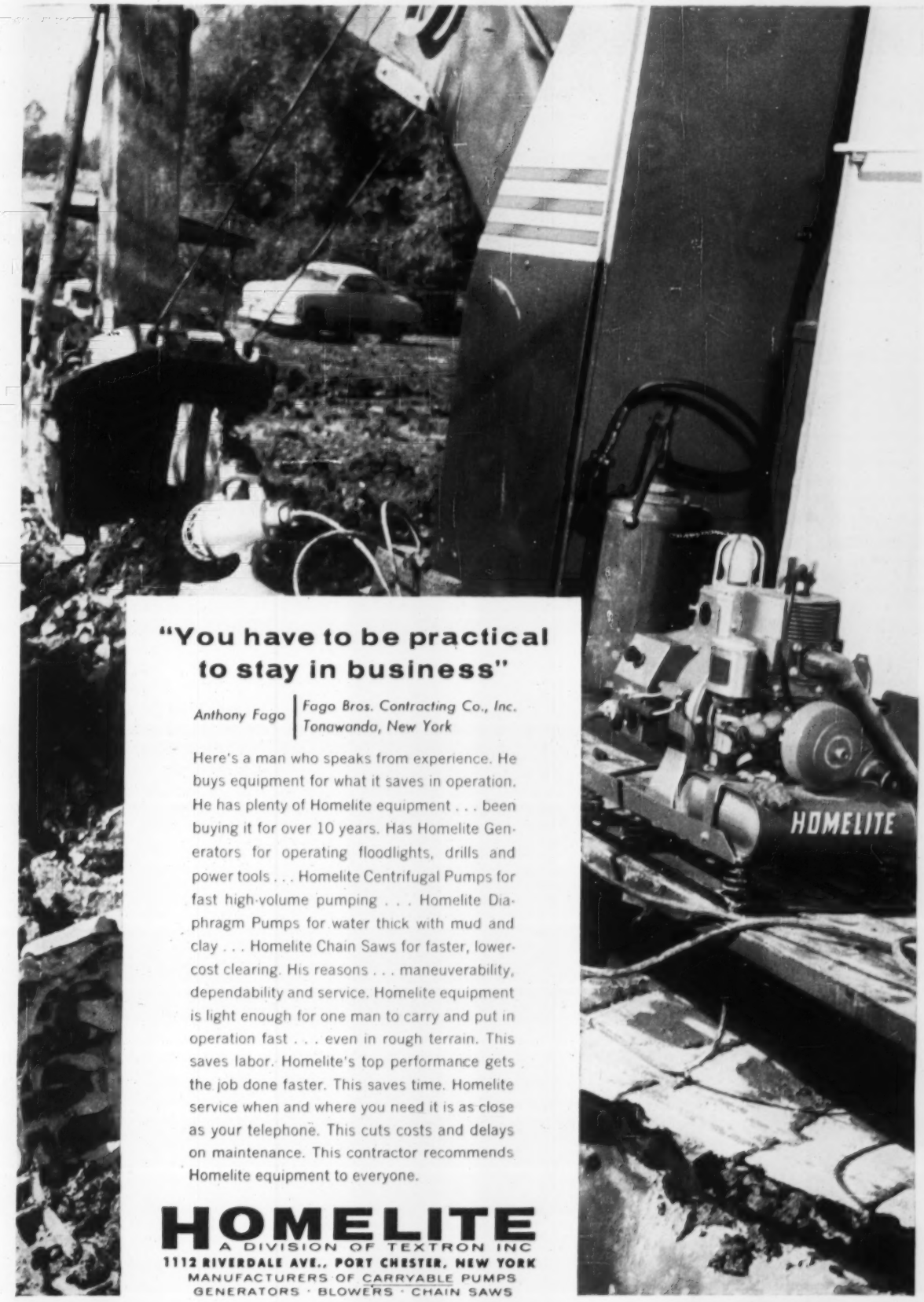
The problem is that column supports for the widened tunnel must carry the weight of steelwork that supports the tunnel roof. Until train operations have been shifted to the new section of the tunnel, the steelwork must have temporary support. There are no standard methods of providing such support, since each section of the job has its own peculiar problems.

One way to make the tie-in is by setting new columns and supporting beams which are then spliced onto existing subway bents. After the splice is made, the old columns can be removed with the entire load shifting to the new exterior columns.

But in other portions of the job the task is not so straightforward. Instead of tying into existing steelwork by direct splicing, auxiliary beams with temporary hangers must be used to support girders and beams, and the load shifting must be done according to a carefully devised plan. Load shifting, from temporary to permanent supports coupled with addition of supporting girders, beams and columns are the keys to this type of construction.

(*Continued on page 46*)

FOR MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES



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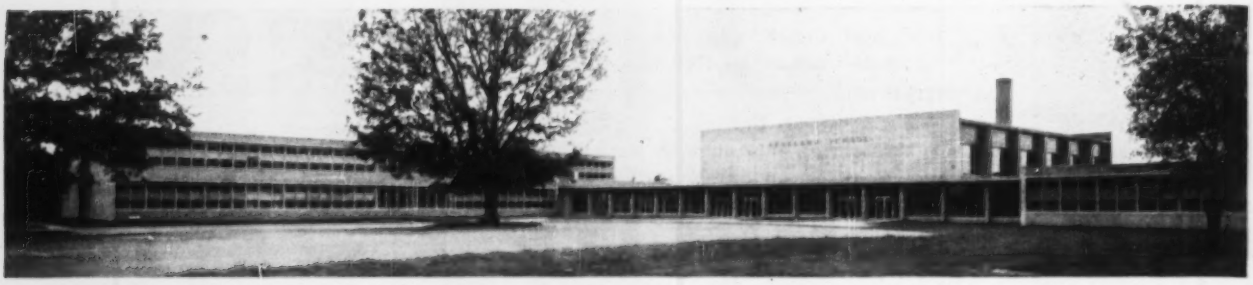
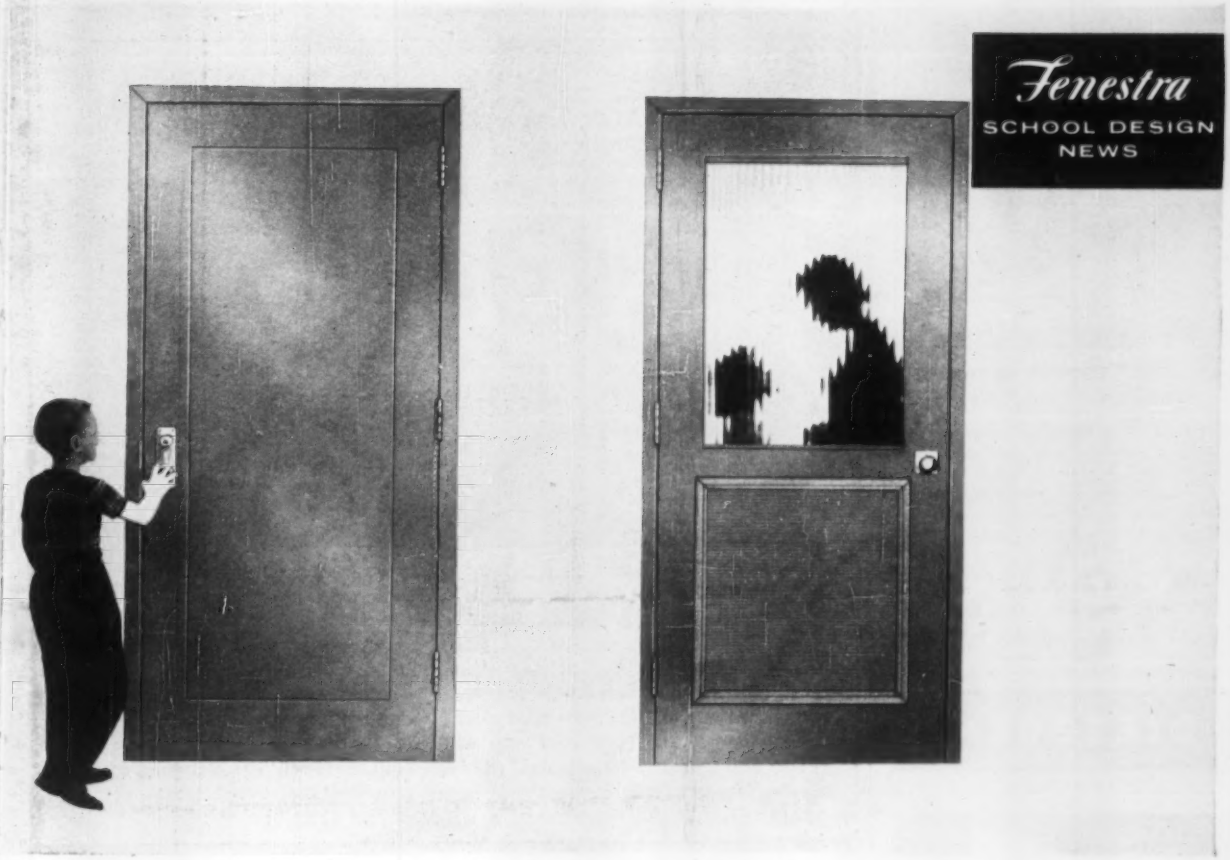


REIDLAND SCHOOL, Paducah (Reidland), Ky., cost less to build because 134 Fenestra 1¾" Hollow Metal Flush Doors were used. *Architect:* G. Tandy & Lee Potter Smith, Paducah, Ky. *Contractor:* Erhart-Knopf Construction Co., Inc., Louisville, Ky.



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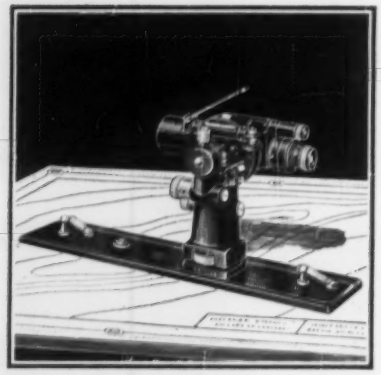

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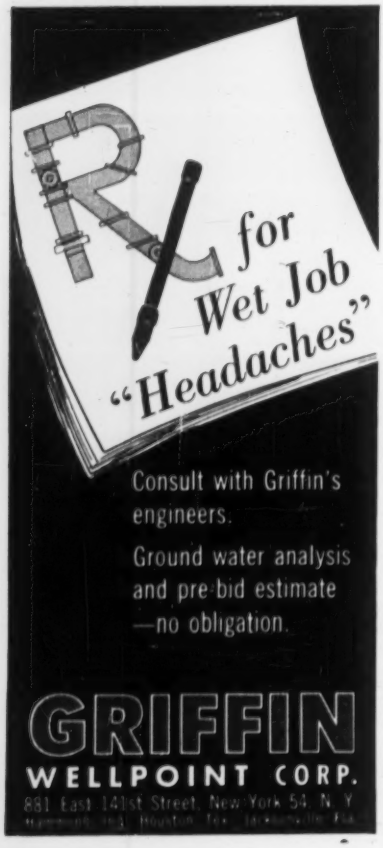
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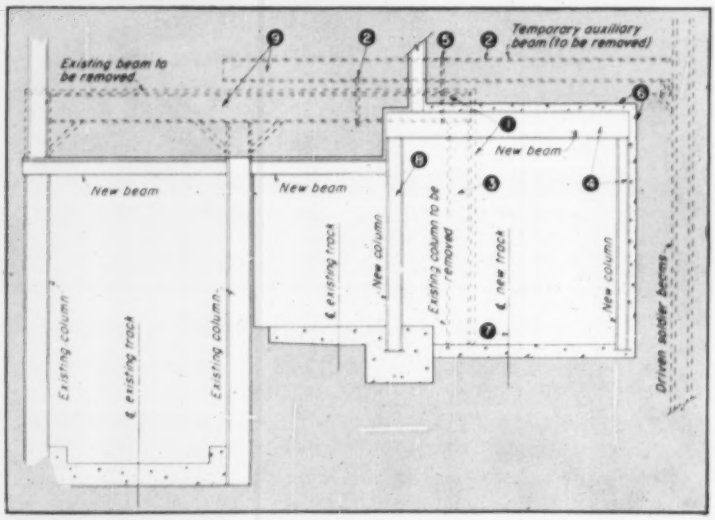
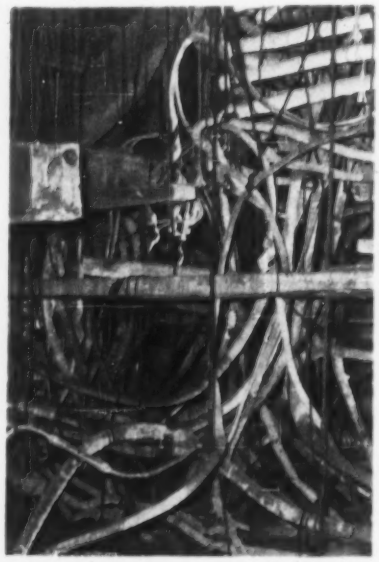
. . . Load transfer technique used



AUXILIARY BEAMS act as temporary support of existing steel in this section where no direct splices are made. The following steps are taken in this type of construction after trackwork is shielded: (1) Existing concrete wall and a portion of the roof are broken out. (2) Auxiliary support beam is set to pick up existing roof beam and a portion of the roof. (3) Exterior column is removed. (4) New exterior column and roof beam are set. (5) New roof steel is hung from auxiliary beam with rigid hangers. (6) New roof and wall are concreted. (7) New track is laid and traffic is transferred. (8) New column is set. (9) Remainder of roof is removed, auxiliary beam is removed and construction is completed. Careful supervision is a "must" on this job.

• **Construction data**—Some 142,000 cu yds of earth had to be removed both by clamshell and by hand. Above this was placed a total of 14,250 sq yds of timber decking to make up the temporary street and sidewalks. A total of 14,300 cu yds of old masonry had to be removed and 35,500 cu yds of concrete will go into the new construction. For permanent structural steel, about 4,560 tons will be used, not including the amount needed for temporary supports during construction. Where possible, temporary steel used during load-transfer operations is being salvaged to be re-used. Much of it, however, cannot be salvaged and must be left in place underground to be backfilled.

Poirier & McLane Corp., which in most cases designed the temporary steel framework and devised means of completing the structure without disrupting tram service, holds a $13.2 million contract for the major portion of the job. The Transit Authority had allocated about $20 million for this subway improvement. The design of the project was carried out by the Authority's chief engineer, John Daly, with Harry Newman a resident engineer. For the contractor, John J. Decker is the project manager. Larry O'Neil and Ernst Bodily are general superintendents on the job with Ugo Serra-Zannetti being the contractor's project engineer.



EXISTING CABLES are supported and maintained during excavation and construction of redesigned subway system.

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Denver's Coliseum is a handsome example of the functional use of concrete for arenas requiring uninterrupted enclosed space with minimum maintenance. Its arched construction requires no supporting pillars and provides a clear and unobstructed view of the entire arena area. Only concrete, the completely plastic building material, can be so molded and formed into any shape with all of its strengthening reinforcement inside.

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Mobile Crane-Excavator . . .

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The Model 11-B transit crane-excavator is designed to be convertible from a 10 ton lifting crane to a dragline, clamshell, hoe or shovel to handle a variety of jobs. The 11-B is mounted on a modern six-wheel drive carrier, which provides up to 47 mph speeds.

All-round mobility to cut high operating costs on scattered-job schedules plus ease of maintenance and quick accessibility are key features of the new machine, says the manufacturer. Bucyrus-Erie Co., South Milwaukee, Wisconsin.

Powered Concrete Buggy Also Serves as Fork-Lift

Ability to carry 3,000 lb in an 18 cu ft hopper or when used as a platform carrier is one of the features in the Kwik-Mix "Moto-Bug". As a fork-lift, the new model will raise 1,500 lb to seven feet.

Carrying a full load, the "Moto-Bug" can climb a 25% grade and turn in an 84 in. radius, according to the manufacturer.

A direct drive to the transmission eliminates shifting and reduces vibration. A maximum speed of 12 mph either forward or reverse is obtainable.

The manufacturer claims that low relative weight combined with high maneuverability increases the number of job applications of the buggy. Kwik-Mix Co., Div. of Koehring Co., Port Washington, Wis.

Concrete Gun Model Has 9 Cu Yd Per Hour Rate

A higher production Airplaco concrete gun, Model 1600-H Nucretor has been announced. The gun has a maximum production or gunning rate of 9 cu yd per hour, and is said to give the highest production to air ratio of any gun thus far manufactured.

The model is designed and recommended for gunning applications requiring high volume production—such as for swimming pool construction, ditch lining, bank stabilization or revetments where high production is a necessity.

The concrete gun is semi-automatic in operation and weighs about 700 lb. Air Placement Equipment Co., 1009 W. 24th St., Kansas City, Mo.

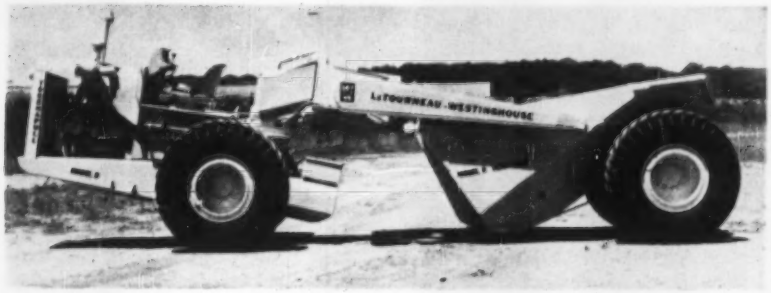
New Portable Form Cleaner Wire-Brushes Steel Panels

A portable power-driven form cleaner designed to reduce form-cleaning costs has been developed. According to the manufacturer, important savings result from the speed and thoroughness with which steel forms are cleaned.

Known as the Efco Form Cleaner, it works equally well on Efco steel forms, Economy steel forms or on almost any panel form not over 30 in. wide.

The forms are loaded on a conveyor belt that pulls them under a rapidly rotating steel wire brush. They are automatically cleaned and oiled, emerging from the far end of the conveyor belt ready for reuse. Economy Forms Corp., 4031 N. E. 149th St., Des Moines, Iowa.

Low Silhouette Version Rear Dump . . . .



. . . . Squats for Easier Loading

Specially designed for underground operation and other jobs where clearance and maneuverability are important, is a low silhouette version of the 11 ton Model D Tournapull.

In addition to reduction in overall height, the new design incorporates a "squat" feature that permits lowering of the dump bowl to accommodate even the small tractor-shovels.

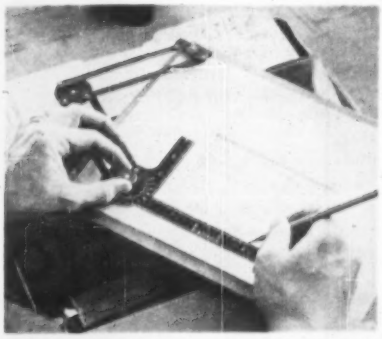
The squatting action is made possible by a two-position air valve control, which activates an electric motor to raise and lower the bowl.

With the exception of its ability to squat for loading and its overall lower silhouette, the new model retains the same basic features of standard equipment.

It is only 8 ft wide and maneuvers easily, making complete 180 deg turns in less than its own length, say the manufacturers.

For the present, the Lo Dump "D" will be built as a special order unit at a price $400 above the Standard "D". LeTourneau-Westinghouse Co., Dept. 085, Peoria, Ill.

Portable Drafting Tool Fits in User's Pocket



A portable drafting machine is compact enough so that when folded jackknife-style it will fit in the pocket after being detached from its drawing board. Called Draftette, the unit—which takes the place of T-square, ruler, protractor and triangles—is available attached to drawing boards of three different sizes.

The complete drafting unit with a 10x15 in. drawing board sells for $5.95, with 11x17 board, $6.50, with 20x26 board $18.95. David Miller & Associates, Box 572, Beverly Hills, Calif.

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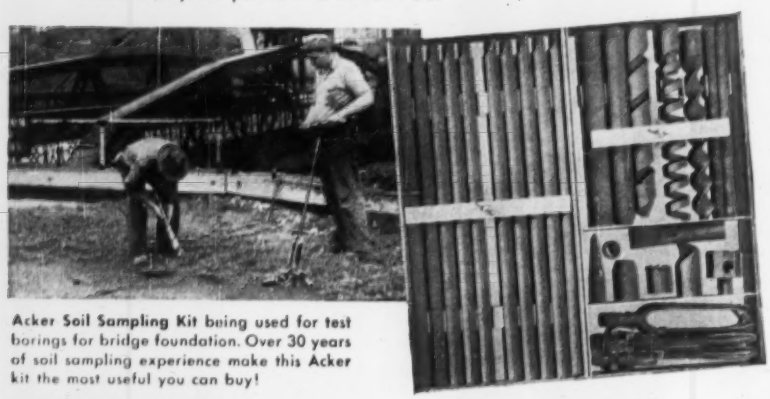

Acker Soil Sampling Kit being used for test borings for bridge foundation. Over 30 years of soil sampling experience make this Acker kit the most useful you can buy!

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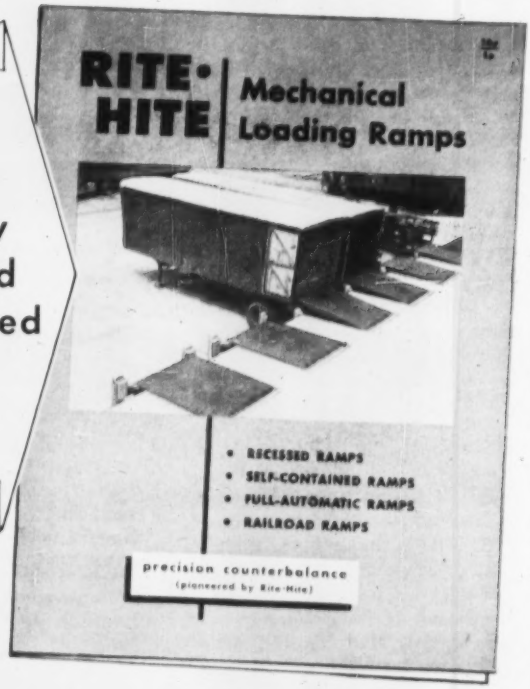

RITE-HITE DIVISION

LOOMIS MACHINE COMPANY

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Publications

Paving forms—Bulletin CRPF-376 illustrating design, specifications and application of Clark paving forms with Wedge-Loc joint is available. CLARK INDUSTRIES, CONSTRUCTION EQUIPMENT DIV., 375 E. FIFTH AVE., COLUMBUS 1, OHIO.

Testing—THE TESTING WORLD, a monthly publication is offered regularly to engineers, architects, teachers and contractors. SOILTEST, INC., 4711 W. NORTH AVE., CHICAGO 39, ILL.

Asphalt maintenance—A pictorial presentation on six ways to improve and maintain old bituminous pavements is found in a booklet: "Comprehensive Facts About Heater-Planer Work." JIM JACKSON CONTRACTOR, P.O. BOX 25, ASHER AVE. STATION, LITTLE ROCK, ARK.

Tractors—A maintenance guide for Caterpillar D2, D4 and D6 Tractors has been prepared for operators. It is illustrated with more than 80 drawings. ADVERTISING DIV., CATERPILLAR TRACTOR CO., PEORIA, ILL.

Aggregates—A booklet describing and illustrating Blaw-Knox gravel beneficiation, a process for up-grading aggregate, is available. The firm's elastic fractionation theory is explained. GRAVEL BENEFICIATION, CONSTRUCTION EQUIPMENT DIV., BLAW-KNOX CO., MATTOON, ILL.

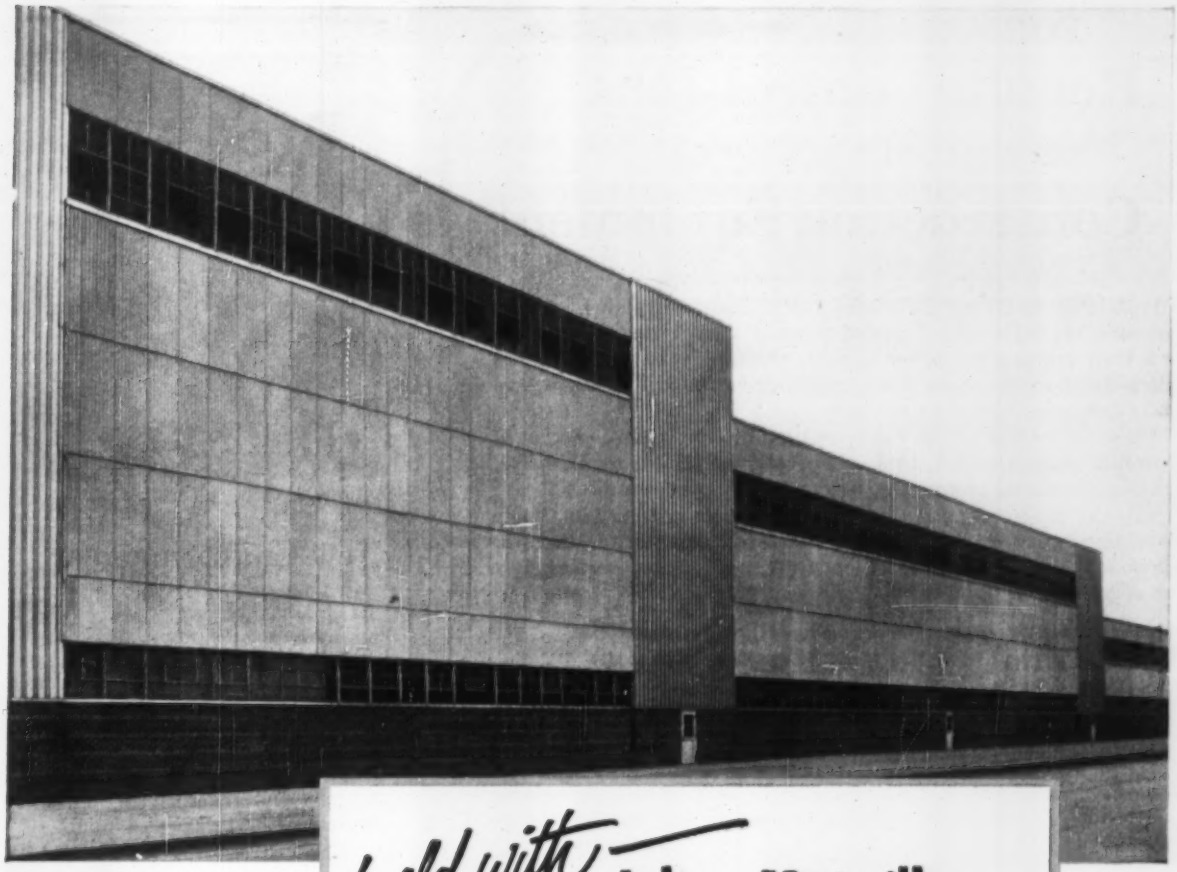
Power shovels—Just off the press is a catalog describing in detail the 35 ton Moto-Crane, model MC-530, recently added to the Lorain line of power shovels and cranes. THE THEW SHOVEL CO., LORAIN, OHIO.

Diesel tractors—A catalog, "The Complete Line of Contractor Proven High Capacity Equipment", describes heavy diesel wheel tractors and allied equipment. M-R-S MANUFACTURING CO., FLORA, MISS.

Shovel cranes—A 16 page catalog describes the self-propelled, shovel crane, model SP-107. Interchangeable parts and turntable features are illustrated. THE THEW SHOVEL CO., LORAIN, OHIO.

Dredges—Recent advances in dredges are discussed in a bulletin (925) containing photographs showing dredges in operation, and illustrating 15 different applications. ELLICOTT MACHINE CORP., 1611 BUSH ST., BALTIMORE, MD.

No costly maintenance problem here



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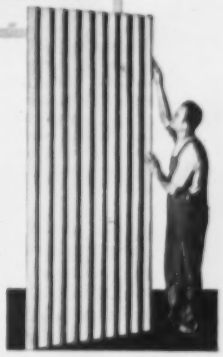
For maintenance-free exterior walls and roofs, plus protection from fire, rot and weather

YOU SAVE MONEY on construction and maintenance when you build with Johns-Manville Corrugated Transite®. Corrugated Transite comes in large sheets that require a minimum of framing . . . permit fast, economical construction of industrial, commercial, institutional and agricultural buildings.

Made of asbestos and cement, Corrugated Transite is practically indestructible. It never needs paint or special treatment to preserve it . . . it's fireproof and rotproof. Corrugated Transite is also used increasingly for interiors. The streamlined corrugations and attractive shadow lines offer interesting design possibilities.

Investigate Johns-Manville Corrugated Asbestos Transite and learn how you can build quickly and easily . . . have an attractive, long-lasting, trouble-free structure regardless of size or purpose. For complete details, write Johns-Manville, Box 158, Dept. EN, New York 16, New York. In Canada, write 565 Lakeshore Road East, Port Credit, Ontario.



- Large sheets go up quickly
- Easy to fasten to steel
- Easy to nail to wood
- Easy to saw
- Easy to drill

JOHNS MANVILLE JM PRODUCTS

Johns-Manville

TRU-LAY *flexible* PUSH-PULLS

FOR Remote Control Jobs on a great variety of Construction Equipment

Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers and other construction equipment.

These dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

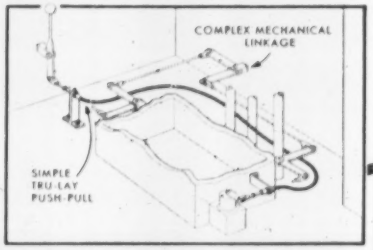
TRU-LAY PUSH-PULLS are dependable and accurate even under the most adverse conditions

They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls increases ease of operation and means the virtual elimination of maintenance.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below

Simplicity vs Complexity

Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



"Solid as a rod but *flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Our **DATA FILE** *will answer your further questions*
Write for a copy without obligation

Push-Pull DATA FILE

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AUTOMOTIVE and AIRCRAFT DIVISION
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Men and Jobs

Boris Lochak

New Chief Engineer

Gibbs and Hill promotes overseas operations head

Gibbs and Hill Inc. has announced appointment of a new chief engineer. He is Boris Lochak, former director of foreign operations for the company—the man, associates claim, who has been largely responsible for the firm's big increase in overseas ventures.

In his new position, he will direct design and engineering services in the fields of power, industrial work, railway electrification, highways, water supply and waste treatment. A technical staff of about 400 men will be under his supervision.

Boris Lochak left Nazi-occupied France in 1941, following 13 years of engineering practice in Paris. He joined Gibbs and Hill in New York as a structural engineer for domestic power projects the following year.

When the company secured its first foreign assignment—for the French provisional government in 1944—Mr. Lochak was placed in charge. The program included design and supervision of two power plants, engineering and procurement of equipment for practically every harbor in France, and surveys for French industry that extended into major fields of industrial activity. By 1949, he was made director of foreign operations.

The following years were marked by Gibbs and Hill's success in securing engineering contracts in Europe. Boris Lochak has been responsible for the supervision of design and construction of several central station power plants in France, Italy, Spain, Taiwan and other countries. Present projects in-

clude nuclear power plants in Belgium and Italy.

At a time when many firms have been suffering the effects of stiffened competition from European engineering and construction companies, Gibbs and Hill has been increasing steadily its volume of foreign work. The company reports that its overseas engineering contracts for 1958 are related to $106 million of construction costs; this is a fourfold increase over 1957 figures of $28 million. And the paradox is that the bulk of these contracts are locally financed jobs located in Western Europe, stronghold of the toughest competition U. S. engineers face.

"The formula for our success is a simple one—we do not compete with the Europeans," says Chief Engineer Lochak. "When we assume overall responsibility for a job, we arrange for as much of the work as possible to be given to local engineering firms. American personnel participate only to the extent that local know-how is not available."

"We also try to make the best use of European and American equipment so as to combine them in an optimum manner. Thus the client can save scarce American dollars and we are not considered a threat to the local economy."

He anticipates many more overseas jobs for his firm. The field of nuclear power particularly, he believes will offer many opportunities.

Boris Lochak is a civil engineering graduate of Ecole Nationale des Ponts et Chausees, Paris, France. He was chief engineer of the Foundation Company of Paris from 1926 to 1933. He established a private practice as a consulting engineer during the years 1933 to 1939.

He fills the position vacated by John B. Saxe. Mr. Saxe has been appointed chief consulting engineer for the firm.

Col. C. M. Sciple to Get Command of Gulf District

Col. Carl M. Sciple, commandant, Granite City Engineers Depot, Ill., has been assigned as District Engineer, Gulf District, Mediterranean Division, Corps of Engineers, effective early 1958. The Gulf District extends westward from Pakistan to North Africa and is headquartered at Tehran, Iran.

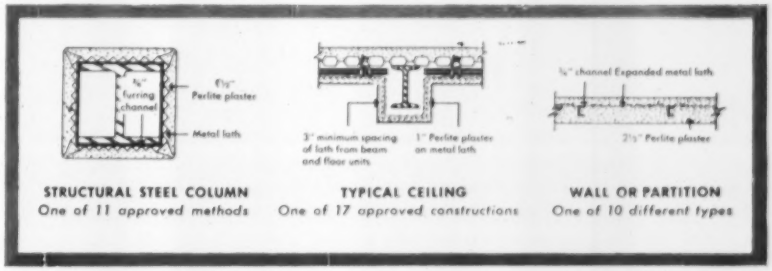
Colonel Sciple's successor will be Col. Charles H. Waters, now commander of the Engineer Center Regiment, Fort Belvoir, Va.

38

There are 38 ways to cut dead load and get maximum fire protection with Permalite®

THE LARGEST-SELLING PERLITE AGGREGATE IN THE WORLD

Pound for pound, dollar for dollar, no other system of fireproofing surpasses the versatility of lightweight Permalite-aggregate plaster—a fact proved in many of the nationally known buildings erected during the past 10 years.


¾" furring channel
Perlite plaster
Metal lath
3" minimum spacing of lath from beam and floor units
1" Perlite plaster on metal lath
¾" channel Expanded metal lath
2½" Perlite plaster
STRUCTURAL STEEL COLUMN
One of 11 approved methods
TYPICAL CEILING
One of 17 approved constructions
WALL OR PARTITION
One of 10 different types

WEIGHT—In multi-story steel frame construction, with conventional fireproofing, more than 10% of the steel does nothing but hold up its own fireproofing! Permalite-aggregate plaster lets you cut this dead load. For example, the fireproofing weight on a typical column fire-protected with Permalite-aggregate plaster ranges from 38% to as little as 11% of the weight of conventional fire-proofing—and still gains a full 4-hour fire-rating.

FIRE RESISTANCE—Permalite expanded perlite is completely inorganic—cannot burn or support combustion. Fireproofing constructions using perlite-aggregate plaster have been tested and approved by the Underwriters' Laboratories, by the National Bureau of Standards and by nationally famous universities and laboratories . . . methods approved, accepted and used from Massachusetts to California.

BONUS FEATURES—Since no expensive forms are required for fireproofing with Permalite-aggregate plaster, both days and dollars are saved. And finally, most important, the Permalite plaster fireproofing itself furnishes a perfect base for interior finishing and decorating.

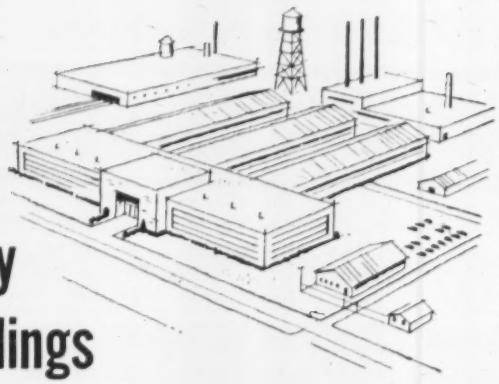
WRITE FOR YOUR COPY

The new 1958 Permalite plastering specifications and fireproofing data are now ready. While more than 50 perlite fireproofing systems have building code approval, only the 38 most economical are listed.

PERLITE DEPARTMENT
GREAT LAKES CARBON CORP.
612 South Flower Street • Los Angeles 17, California

PARKERSBURG
METAL BUILDINGS

It pays to Expand with Quality Metal Buildings



Functional Parkersburg metal buildings feature the true quality that pays off in the long run . . . precision-engineering, heavy-gauge steel, super-strength panel interlock, weather-tight construction. As the best quality line, these Parkersburg metal buildings offer you the greatest overall dollar-for-dollar value available today. Supplied in a range from small tool sheds to large factory-type buildings. Write to Department M-3 for further information.

60 Years of Successful Service!

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Division of Parkersburg-Aetna Corporation
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PARKERSBURG
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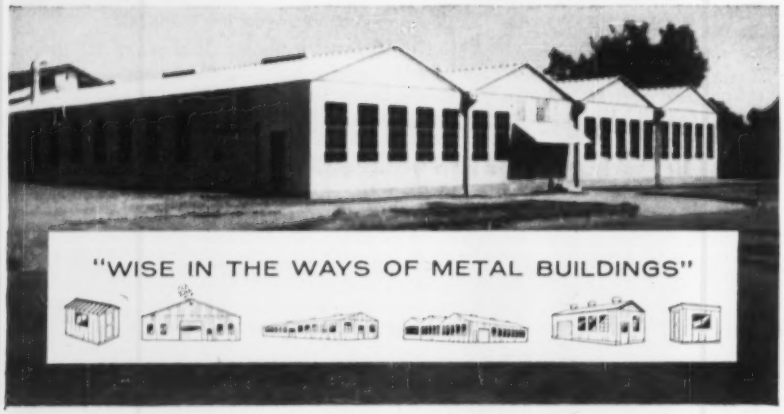


Obituaries

Robert E. Smith, 60, died late in October at Van Nuys, Calif. He was the U.S. Public Works Administration's resident engineer in charge of construction on the Chicago Sanitary District's Sewage disposal plant in the late Thirties. Mr. Smith graduated from the University of Wisconsin in 1920 with a B.S. in Civil Engineering. He was supervising engineer of the Big Inch and Little Inch war emergency pipelines' construction from Cincinnati to the Gulf of Mexico between 1943 and 1948. From 1948 to 1951 he was supervising and resident engineer for airports and radar bases in South Dakota and Iowa.

Roscoe C. Tindall, 70, architect, died Oct. 7 in Wilmington. He was president of the Delaware State Board of Examiners and Registration of Architects. During World War II, he served as manager of the War Housing Center.

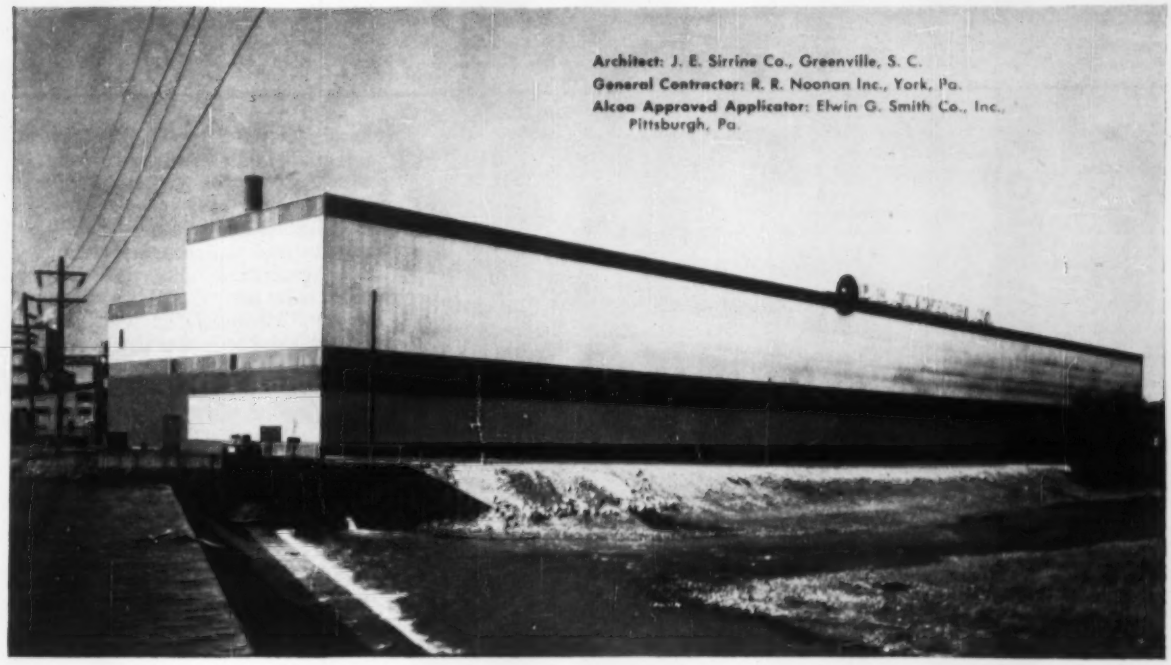
Bennett T. Gordon, 55, engineer and bridge-design specialist, died Oct. 18 in Philadelphia. He was a partner in the firm of Richardson Gordon and Associates. He was a graduate of Mississippi State University.

Ernest J. Matthewson, 62, architect, died Oct. 22 in Media, Pa. A graduate of the University of Pennsylvania in 1921, he was associated with the architectural firm of Gleeson & Mulrooney, Philadelphia.

Joseph D. Baldez, 87, architect and designer of the grandstand at Churchill Downs, died in Louisville Oct. 22. He retired in 1945 as vice president of D. X. Murphy & Brother, architects.

W. Gordon Jamieson, 63, architect, died Oct. 23 in Denver. He held degrees from the Rhode Island School of Design and the Beaux Arts Institute of Design. He was secretary-treasurer of the Colorado Board of Architects' Examiners for 15 years.

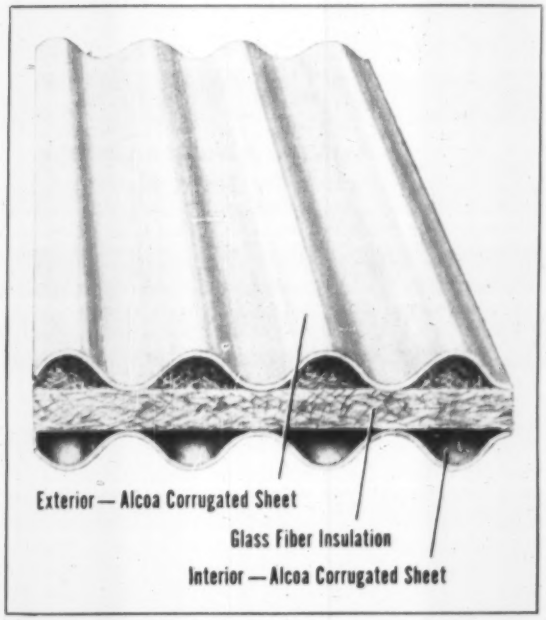
Maurice E. Gilmore, 79, consulting engineer and commissioner of public works for the Federal Works Agency from 1940 to 1944, died Nov. 21. A construction engineer on the Panama Canal from 1906 to 1913, Mr. Gilmore had also seen service as an engineer in the Interior Department's Indian Service, and in 1944 joined the State Department where he served for three years as a consultant to the coordinator of Inter-American Affairs. Since 1947, he had been in private business both in this country and South America.



Architect: J. E. Sirrine Co., Greenville, S. C.
General Contractor: R. R. Noonan Inc., York, Pa.
Alcoa Approved Applicator: Elwin G. Smith Co., Inc., Pittsburgh, Pa.

Brick and translucent plastic combine beautifully with aluminum sandwich wall in the new P. H. Glatfelter paper plant in Spring Grove, Pennsylvania. Low cost, insulating efficiency and maintenance-free durability were major factors in the selection of sandwich wall.

Speed Erection, Cut Costs with Sandwich Wall of Alcoa Aluminum



Sandwich wall of Alcoa® Aluminum is the lowest cost insulated metal wall system known. Its lighter weight speeds erection, reduces foundation and framing requirements. Clients can move in sooner, too.

Sandwich wall with 1" of glass fiber insulation has three times the insulating efficiency of 8" masonry. Maintenance is nil and painting is permanently eliminated. Corrosion-proof aluminum defies smoke, fumes, humidity and salt air.

Cut costs for your clients. Specify sandwich wall of Alcoa Aluminum for industrial buildings. Complete data available from your nearest Alcoa sales office or Alcoa Approved Applicator. Or write Aluminum Company of America, 860-Z Alcoa Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM
INDUSTRIAL BUILDING PRODUCTS

Your Guide to the Best in Aluminum Value

NEW! "ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

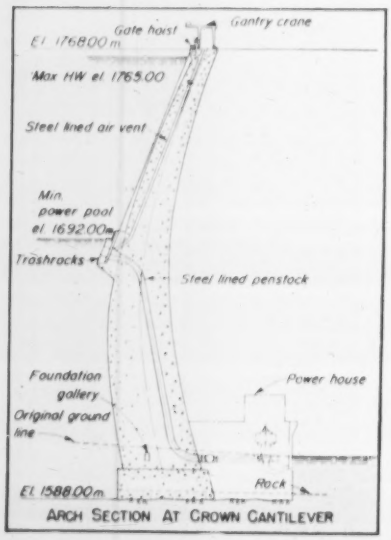
DOUBLE-ARCH Karadj Dam will stand 590 ft high and be able to impound 166,000 acre-ft of water for municipal, irrigation and power use.

Iran starts a new river project as . . .

Karadj Dam Goes to Contract

One of the 10 highest concrete dams in the world will be Iran's 590 ft Karadj, to be built near Tehran by Morrison-Knudson Co., Inc., which recently signed a $41.5 million contract with the government of Iran.

The dam is to be located on the Karadj River, some 25 miles northwest of Tehran. Although power and irrigation are featured, Karadj primarily is a water supply for the city's more than one million population.



POWER INTAKE will be integral part of main dam structure.

The Morrison-Knudsen contract of about $41.5 million is a cost-plus-percentage-fee contract—that is, a contract including a target estimate together with bonus and penalty clauses.

• **Engineering features**—The full Karadj project—estimated at $54 million—also includes a 100 ft high downstream regulating dam. Karadj dam will have an over-all length of 1,280 ft with a base thickness of 98 ft and top width of 26 ft to contain 915,000 cu yds of concrete. A double-curvature arch, the dam will be of horizontal circular arches of nearly constant central angles. Downstream radii of these angles range from 193.5 ft at foundation level to 650 ft at top level. A chute-type spillway located at the right abutment is designed for a capacity of 51,200 cfs with two tainter-type crest gates each 30 x 36 ft.

Scheduled for completion in the middle of 1961, the dam will impound water from a drainage area of 295 sq mi having an annual average runoff of 382,000 acre-ft. At its maximum operating level the dam will impound 166,000 acre-ft of water allocated as follows: municipal water supply, irrigation and power—107,000 acre-ft; reserve storage—31,600 acre-ft; and dead storage—26,700 acre-ft.

Ultimate power capacity of Karadj will be 120,000 kw when operating with three generating units. Initially, however, only two 40,000 kw generating units will be installed with provision for the third at a later date.

Harza Engineering Co. International of Chicago prepared the project planning report and made the contract plans and specifications. At present it is preparing the construction drawings and will furnish engineering supervision during construction. Erik Rettig is resident manager at the damsite, with Bruce Johnson serving as project manager at the Chicago office. E. C. Shipp is the project manager for Morrison-Knudsen.

Russia Claims World's Biggest Power Line

The Russians are claiming another "biggest". This time it is the world's biggest transmission line, a 620 mile 500 kilovolt line that can carry 1.5 million kw.

The power line is under construction between Stalingrad hydro station on the Volga River and Moscow, and is to be ready in 1958 when Stalingrad station, of 2.3 million kw capacity, is to start generating.

Towers 89 ft high are being erected at 1,650 ft intervals to support two parallel three wire lines.

Construction of the Stalingrad-Moscow line is part of a national program designed to establish a single power grid over the whole of Russia.

Asian Contractor Groups Schedule Joint Meeting

The Philippine Contractors Association will hold its 12th annual convention jointly with the Federation of Asian & Western Pacific Contractors Associations, March 5 to 9, in Manila.

Purpose of the five-day meeting is:

• To bring about closer contact, international fellowship and cooperation among contractors in Asia and the Western Pacific.

• To exchange information on engineering construction technology.

• To develop and strengthen the relationship between the governments and the contractors.

• To establish, in accordance with the laws of the member countries, cooperative working arrangements in the

furtherance of engineering building construction projects.

Groundwork for the meeting was laid by federation officials during their recent tour of member countries, including Japan, Free China, South Korea and Australia.

Topics for discussion will include construction methods, contract procedures and specifications, and relationships with government contracting agencies. Also to be discussed will be administrative procedures adopted by construction firms and how each association can help create an "atmosphere conducive to the growth of the construction industry."

Non-member countries invited to attend are India, Hong Kong, Thailand, Burma, Ceylon and the Federated Malay States.

British to Build Nuclear Power Plant in Italy

A contract to build a 200,000 kw, $40 million nuclear power plant in southern Italy has been received by the Nuclear Power Co., London. The English firm, one of a number of consortiums formed to execute Great Britain's big nuclear program, currently is engaged in construction of the 300,000 kw Bradwell, Essex, plant.

The same firm also is reported negotiating for another Italian nuclear plant to be built near Milan in northern Italy.

Israelis Complete Huge Huleh Drainage Scheme

Last month, Israel removed a plug in the Jordan River and water from 15,000 acres of swamp began draining off in a new network of canals. This marked the completion of five years' work to reclaim the formerly malarious Lake Huleh for agricultural development (ENR July 19, 1956 p. 59).

In a few weeks time it is expected that the swamp will be dry enough to utilize its peat-rich soil for crops. The project involved over 4 million cu yd of rock excavation and dredging.

Egypt to Invite Bids for Suez Canal Improvements

The nationalized Suez Canal Authority will invite international bids for widening and deepening the Suez Canal shortly, according to Mahmoud Youness, chairman of the authority.

Mr. Youness said he will visit the U. S. to try to get equipment, particularly dredges, necessary for maintenance.

Torresdale Filter Plant: Morris-Knowles, Inc., Design—McCloskey & Co., Construction
in PHILADELPHIA
or THAILAND
Spillway Structure, Greater Chao Phya Project—Royal Irrigation Department

Servicised Rubber Waterstop and Self-Expanding Cork Joint Filler SOLVE the SAME PROBLEM

When engineers for two widely separated projects—the Spillway Structure of the Greater Chao Phya Dam in Thailand and the Torresdale Filter Plant in Philadelphia specified premolded expansion joint and waterstop, they chose Servicised Self-Expanding Cork Joint Filler and Dumbbell-Type Rubber Waterstop for optimum performance under every condition.

Servicised Self-Expanding Cork is a "maximum performance" material that will keep joint spaces filled under contraction which opens the space to more than its original size. Specially treated to enable it to expand as much as 50% beyond original thickness, Servicised Self-Expanding Cork is fully compressible, non-extruding and resilient. It is widely used in water and sewage treatment plants, canal linings, outlet works, stilling basins of dams.

Servicised Dumbbell Type Rubber Waterstop provides superior characteristics of ultimate elongation, tensile strength and retention in the concrete during contraction to insure an effective seal of joints against water pressure. Available in 2 types—Hollow Bulb and Flat, in 6", 9" and 12" widths. New Union makes field splicing a fast, simple operation. Split Type Waterstop also available.

Servicised products for the construction industry are illustrated and described in the new Servicised Catalog. Write for your copy.

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Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service.

Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.

MADESCO BLOCKS

MADESCO TACKLE BLOCK CO.
EASTON, PA.

Engineered to Serve Your Special Service Needs

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Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

Write for free descriptive Bulletins.

Also builders of coal and ore bridges and unloaders, and specially designed machinery.

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PNEUMATICALLY PLACED CONCRETE

for — Swimming Pools
Fireproofing Structural Steel
Lining Steel Stacks & Bunkers
Repairing Docks, Dams & Bridges
Reservoirs — Insulating Concretes
Water Main Lining — Thin Walls
Sewer Repairs — Lining Rock Tunnels
Pile Protection — Prestressed Tanks
Stucco Coatings — Pressure Grouting

We are Gunite contractors and engineers of long, extensive experience covering many hundreds of jobs. Get in touch with us for complete engineering data and estimates on your problem.

GUNITE CONSTRUCTION CORPORATION
38-75 13th Street, Long Island City 1, N. Y.
STillwell 4-8124

Water Supply Expansion in Montana

Nine awards totaling $1,142,585 by City of Bozeman, Mont., on two phases of its water improvement, are 6.6% below estimate of the engineers, Morrison, Maierle, Inc., Helena, Mont.

	Amt.	%
Haggerty-Messmer Co.		
Reservoir 4 mg	$189,980	16.6
Booster station	38,000	3.3
Lyman Creek Reservoir improvement	21,940	1.9
Presedimentation basins	107,886	9.4
Statewide Plumbing & Heating Co., Inc.		
Distribution system improvements	248,977	21.8
Presed basin supp lines (dam to basin)	191,900	16.3
Reservoir supply lines (basins to reserv.)	117,062	10.8
City supply line (reservoir to city)	195,965	17.2
Long Construction Co.		
Hyalite Creek Dam	30,875	2.7

Contract for city supply line went to concrete pipe with alternates on steel pipe mortar lined and coated, and cast iron pipe with mechanical joints. Concrete is 3,000 psi at 28 days. CIP is Class 200 MJ or Tyton joint.

Wages include: common labor $2.15; tractor and shovel operators $2.77; carpenters $2.90.

Phase I—4.0 mg Reservoir

1C	Haggerty-Messmer Co., Bozeman, Mont	$189,980
2	Riedesel-Schye-Sullivan, Billings, Mont	196,045
4	Eickhof & Sons, Crookston, Minn	256,055

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Uncl Exc	cy	11,600	$1.20	$1.30
Gravel base	cy	350	2.00	3.00
Drainage, footing	ls	job	620.00	800.00
Reservoir	ls	job	131,800	136,400
inlet box	ls	job	760.00	800.00
valve pit	ls	job	13,100	12,300
RCP in place, 24"	lf	650	14.00	15.00
18"	lf	550	10.00	10.50
ES VCT in place, 12"	lf	550	2.70	2.80
Chlorination house	ls	job	11,600	10,800
Irrigation ditch, relocate	ls	job	1,000	850.00
Grade separation	ls	job	395.00	900.00

Phase I—Distribution System

1C	Statewide Plumbing & Heating, Murray, Utah	*$248,977
2	Eickhof & Sons, Crookston, Minn	293,641
5	Utility Builders, Inc., Great Falls, Mont	412,338

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
CIP MJ in place, 24"	lf	1,519	$20.70	$23.24
14"	lf	9,812	10.40	13.04
10"	lf	9,734	7.00	6.96
GV & VB, 24"	ea	2	1,885	1,664
14"	ea	31	550.00	527.00
10"	ea	27	190.00	218.00
GV in exist. main, 14"	ea	1	600.00	624.00
6"	ea	8	150.00	208.00
4"	ea	2	110.00	198.00
GV & VH, instal exist, etc.	ea	1	60.00	198.00
Fittings	lb	47,426	0.21	0.31
Hydrant	ea	15	400.00	500.00
Ties to exist. main	ea	34	40.00	260.00
Tie water services	ea	87	23.00	36.40

Phase I—Booster Station (Complete)

1C	Haggerty-Messmer Co., Bozeman, Mont	$38,000
2	Wallace Piteman, Bozeman, Mont	38,659
4	Eickhof & Sons, Crookston, Minn	51,221

Phase I—Lyman Creek Reserv Impr

1C	Haggerty-Messmer Co., Bozeman, Mont	$21,940
2	Riedesel-Schye-Sullivan, Billings, Mont	25,834
3	Eickhof & Sons, Crookston, Minn	26,820

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Uncl exc	cy	214	$5.00	$6.00
Conc, remove exist	sy	550	1.40	2.00
in place	cy	335	60.00	70.00

Phase II—Hyalite Creek Dam

1C	Long Construction Co., Billings, Mont	$30,875
2	Haggerty-Messmer Co., Bozeman, Mont	38,700
5	Eickhof & Sons, Crookston, Minn	58,250

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Embankment	cy	2,250	$1.50	$4.00
Conc	cy	170	90.00	110.00
Re-steel	lb	13,000	0.20	0.20
Headgates, meter box, etc.	ls	job	4,600	5,400
Hauling	cy	20,000	0.25	0.15

Phase II—Basin Supply Line

1	Haggerty-Messmer Co., Bozeman, Mont	$184,485
2C	Statewide Plumbing & Heating, Murray, Utah	*191,900
8	Falls Construction Co., Great Falls, Mont	314,250

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1	2C
RCP in place, 21"	lf	18,500	$8.65	$9.04
18"	lf	2,000	7.90	8.55
Gradient boxes	ea	2	300.00	300.00
Valves, air & air vacuum	ea	9	360.00	280.00
Blow-offs	ea	12	400.00	370.00

Phase II—Presedimentation Basins

1C	Haggerty-Messmer Co., Bozeman, Mont	$107,886
2	Riedesel-Schye-Sullivan, Billings, Mont	117,490
5	Long Construction Co., Billings, Mont	151,507

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Uncl exc	cy	12,000	$0.70	$0.85
Comp. gravel base	cy	545	2.00	3.00
Concrete	cy	1,220	51.00	60.00
Re-steel	lb	97,700	0.18	0.15
Basin inlet box	ls	job	1,340	1,500
outlet box	ls	job	1,900	2,000
Footing drainage system	ls	job	350.00	500.00
Basin piping	ls	job	15,000	13,800

Phase II—Reservoir Supply Line

1	Haggerty-Messmer Co., Bozeman, Mont	$110,940
2C	Statewide Plumbing & Heating, Murray, Utah	*117,062
8	Falls Construction Co., Great Falls, Mont	207,300

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1	2C
RCP in place, 18"	lf	13,800	$8.00	$8.44
Valves, air & air vacuum	ea		360.00	280.00
Blow-off	ea	1	400.00	370.00
Tie at reservoir	ls	job	140.00	220.00

Phase II—City Supply Line

1C	Statewide Plumbing & Heating, Murray, Utah	*$195,965
2	Haggerty-Messmer Co., Bozeman, Mont	198,945
5	Long Construction Co., Billings, Mont	259,050

Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Conc cyl pipe in pl, 24"	lf	13,350	$14.50	$14.70
Valves, air & air vacuum	ea		500.00	360.00
Blow-off	ea	1	490.00	400.00
RR crossing	ls	job	1,500	1,800
Tie to reservoir line	ls	job	200.00	300.00
distribution system	ls	job	200.00	200.00

Alternate Bids, City Supply Line

Haggerty-Messmer Co., Bozeman, Mont.

1	Stl pipe, mortar lined & coated	$189,600
1	CIP, MJ	267,030
	Riedesel-Schye-Sullivan, Billings, Mont.	
2	Stl pipe, mortar lined & coated	203,600
3	CIP, MJ	283,700
	Eickhof & Sons, Crookston, Minn.	
2	CIP, MJ	270,636

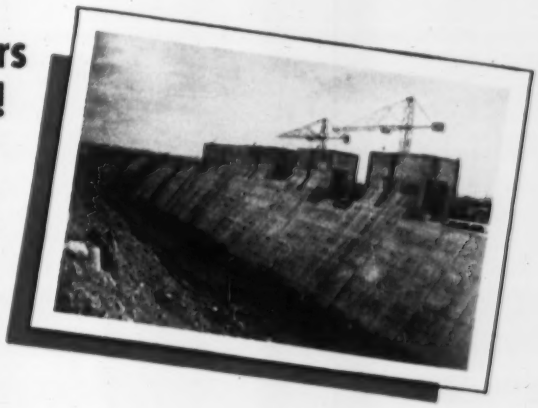
Bids: 6-12-57 Items	Unit	Quantity	Unit Prices 1	2
SP, mortar lined & ctd, 24"	lf	13,350	$14.00	$15.00
Valves, air & air vacuum	ea		360.00	400.00
Blow-off	ea	1	400.00	450.00
RR crossing	ls	job	1,800	2,000
Tie to reservoir line	ls	job	300.00	500.00
distribution line	ls	job	200.00	400.00
CIP, MJ, 24"	lf	13,350	19.80	19.96
Valves, air & air vacuum	ea		360.00	494.00
Blow-off	ea	1	400.00	676.00
RR crossing	ls	job	1,800	2,662
Tie to reservoir line	ls	job	300.00	624.00
distribution system	ls	job	200.00	208.00

* Statewide tied in its bids for distrib. sys. to lines for presed basin supply, reservoir and city supply.

Completion sch: Distribution system 120 cal/da; Hyalite Creek dam 180/cal da; Basin, reservoir and city supply lines 200 cal/da; all other 450 cal/da.

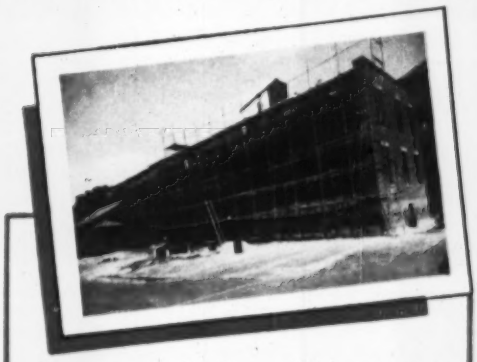
DEWEY AND ALMY
DAREX Newscope

How Darex AEA saved costly man-hours on St. Lawrence Seaway construction!



Contractors on the St. Lawrence Seaway realized important savings in time and money by adding DAREX AEA to concrete. They found that free pouring, air-entrained concrete needed less spading and vibration. Also, AEA reduced surface accumulation of water, shaving hours from the finishing operation.

DAREX AEA helps provide the top strength and durability Seaway walls require. Air-entrained concrete withstands sea water and cold weather . . . is highly impermeable . . . protects reinforcing steel from corrosion. Shown are Cote Ste. Catherine Locks, built by Canit-Canamount Construction Co.



Daracone "raincoat" protects school from weathering and water damage!

To ward off water damage, the exterior walls of St. John the Evangelist School in Cambridge, Massachusetts, are treated with DARACONE water repellent. Reasons: to protect outside masonry exposed to rugged New England weather from spalling, efflorescence and leakage . . . to cut building maintenance costs. Contractor: R. A. Bossi Co. of Boston. DARACONE Distributor: Littleton Construction Specialties.

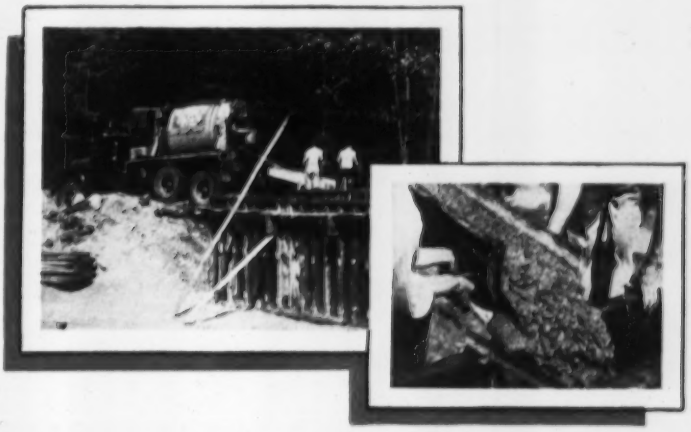
Silicone-base DARACONE penetrates and lines masonry pores and cracks without clogging. It repels water, yet allows the masonry to "breathe." Because DARACONE won't dissolve, wash or wear away, it has been guaranteed by waterproofing contractors for as long as 10 years.

WRDA reduces excess water in concrete, increases workability and strength.

Ready mix plants like Riverside Sand & Gravel Co. of Newton Lower Falls, Massachusetts, are finding that WRDA, Dewey and Almy's new water-reducing agent in easy-to-use liquid form, produces a highly workable concrete mix . . . with top compressive strengths . . . while it cuts water content as much as 20 per cent.

Here's what a Riverside customer, Mr. William Ferro of Camfer Foundations, Lexington, Massachusetts, says about a typical house foundation job in nearby Waltham.

"On jobs like this, where the ready-mix truck can only get to one corner of the forms, I need a high slump concrete that will flow all around the forms without separating. That's why I use Riverside's concrete made with WRDA."



DEWEY AND ALMY CHEMICAL COMPANY
DIVISION OF W. R. GRACE & CO.
Cambridge 40, Mass. San Leandro, Calif. Montreal 32, Canada

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Nov. 28; Next Dec. 26.
- Wage Rates, Building Board, Lath, Insulation: Last, Nov. 28; Next Jan. 2.
- Cement Aggregates, Ready-mixed Concrete Asphalt: Last Dec. 5; Next Jan. 9.
- Iron & Steel Products, Pine: Last, Dec. 12; Next Jan. 16.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta †	**$73.00**	**$76.00**	**$76.00**	**$79.00**	**$81.00**	**$86.00**	**$136.00**	.....	.....
Baltimore *	**95.00**	**100.00**	**100.00**	**100.00**	**100.00**	**105.00**	**114.00**	.....	.....
	100.00g	*105.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*155.00g*	*$150.00*	*$144.00*
Birmingham †	**87.00**	**89.00**	**82.00**	**89.00**	**92.00**	**97.00**	**112.00**	.....	.....
	108.50	*108.50*	*105.00*	*108.00*	*108.00*	*115.00*	*111.50*	*108.50*	*108.50*
Boston ‡	**90.00f**	**90.00f**	**96.00f**	**96.00f**	**96.00f**	**104.00a**	.....	.....	.....
	90.00k	*90.00k*	*106.00*	*106.00*	*106.00*	*109.00*	*115.00*	*118.00*	*122.00*
Chicago **	**94.00**	**97.00**	**91.00**	**105.00**	**113.00**	**114.00**	**109.00**	.....	.....
	101.00	*101.00*	*114.00*	*112.00*	*112.00*	*115.00*	*121.00*	*121.00*	*121.00*
Cincinnati *	**93.00**	**94.25**	**84.50**	**90.50**	**95.00**	**102.75**	**116.00**	.....	.....
	97.00	*98.00*	*102.75*	*104.75*	*105.75*	*109.00*	*130.00*	*130.00*	*130.00*
Cleveland **	**90.00**	**92.00**	**92.00**	**95.00**	**95.00**	**96.50**	.....	.....	.....
			105.00	*96.50*	*96.50*	*97.00*	*136.00*	*136.00*	*136.00*
Dallas ‡‡	**70.00**	**70.00**	**65.00**	**65.00**	**65.00**	**70.00**	**140.00**	.....	.....
Denver *	*Not in stock*		*122.50*	*122.50*	*122.50*	*127.00*	*130.00*	*148.50*	*165.80*
Detroit ‡	**116.50**	**119.00**	**115.00**	**117.00**	**122.00**	**122.00**	.....	.....	.....
	185.00	*185.00*	*187.75*	*188.50*	*180.00*	*156.00*	*186.00*	*196.00*	*196.00*
Kansas City §	**120.00**	**120.00**	**120.00**	**120.00**	**125.00**	**135.00**	.....	.....	.....
	180.00	*180.00*	*180.00*	*180.00*	*185.00*	*150.00*	*150.00*	*225.00*	*225.00*
Los Angeles ‡	*95.00*	*95.00*	*95.00*	*95.00*	*95.00*	*95.00*	*119.00*	*130.00*	*130.00*
Minneapolis ‡	*185.00m*	*185.00m*	*140.00*	*140.00*	*140.00*	*140.00*	*188.00*	*188.00*	*188.00*
Montreal ab	**90.00**	**98.00**	**90.00**	**91.00**	**108.00**	**125.00**	.....	.....	.....
	168.00	*168.00*	*165.00*	*165.00*	*165.00*	*165.00*	*170.00*	*170.00*	*170.00*
New Orleans †	**87.00**	**87.00**	**94.00**	**91.00**	**90.00**	**97.00**	**121.50**	.....	.....
	110.00	*110.00*	*104.50*	*120.00*	*120.00*	*120.00*	*132.50*	*132.50*	*132.50*
New York §	**107.00**	**108.00**	**113.00**	**115.00**	**115.00**	**120.00**	.....	.....	.....
			116.00	*118.00*	*119.00*	*120.00*	*164.00*	*164.00*	*164.00*
Philadelphia ‡		Range from 109/129				**117/137**	**117/137**		
		Range from 130/150				*131/168*	*135/155*	*165.00*	*165.00*
Pittsburgh 2	**120.00**	**120.00**	**125.00**	**120.00**	**125.00**	**130.00**	**145.00**	.....	.....
	180.00	*180.00*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*
St. Louis #	**118.00**	**120.00**	**124.00d**	**128.00d**	**128.00e**	**133.00e**	.....	.....	.....
			187.00	*187.00e*	*187.00e*	*141.00e*	*196.00e*	*196.00*	*196.00*
San Francisco ‡	*74.00*	*74.00*	*80.00*	*80.00*	*80.00*	*80.00*	*102.00*	*115.00*	*115.00*
Seattle †	*67.00*	*68.00*	*65.00*	*70.00*	*70.00*	*68.00*	*75.00*	*85.00*	*85.00*
Toronto a	**91.50**	**95.50**	**90.50**	**91.50**	**91.50**	**91.50**	.....	.....	.....
	115.00	*115.00*	*121.00*	*125.00*	*127.00*	*131.00*	*140.00*	*141.00*	*151.00*

	LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	2x12 Rgh	12x12 Rgh	3/8"	1/2"
Atlanta †	$121.00	$156.00	$22.32	$27.24
Baltimore *	170.00	185.00	25.92	31.60
Birmingham †	115.00	160.00	21.78	26.58
	.....	.....		
Boston ‡	.....	.....	25.92	31.60
	.....	.....		
Chicago **	137.00	137.00	22.45	27.37
	.....	.....		
Cincinnati *	139.25	137.80	25.00	30.48
	.....	.....		
Cleveland **	.....	.....	25.37	30.93
	.....	.....		
Dallas ‡‡	136.00	130.00	18.72	22.80
Denver *	.....	.....	13.92	16.98[
Detroit ‡	130.00	.....	25.00	30.48
	.....	.....		
Kansas City §	.....	.....	16.56	20.16
	.....	.....		
Los Angeles ‡	.....	.....	16.61ab	20.25ab
Minneapolis ‡	.....	.....	19.89	24.25
Montreal ab	122.00	122.00	.....	.....
	.....	.....		
New Orleans †	151.00	181.00	18.72	22.80
	.....	.....		
New York §	240.00	255.00	25.92	31.60
	.....	.....		
Philadelphia ‡	214/224	214/224	28.00	32.00
	.....	.....		
Pittsburgh 2	148.00	185.00	25.92	31.60
	.....	.....		
St. Louis #	.....	.....	18.72	22.80
	.....	.....		
San Francisco ‡	.....	.....	12.22	14.91a
Seattle †	.....	.....	.....	.....
Toronto a	93.50	.....	.....	.....
	.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. §. sad., truckload lots, 8/8 Mfdbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 8M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8 ft. lengths. *k No. 3 common. *l Incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. *m Up to 16"

PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, 3/8", $146.00; 1/2", $166.00. Exterior, waterproof, 3/8" $150.00; 1/2", $170.00. For other centers add rail freight increment from table on proper size. *a Lower rate by water shipment. *b 50,000 lbs. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950a

	Single or Double Strength A quality	Single or Double Strength B quality
Atlanta	78%g	78%g
Baltimore	74%d	76%d
Birmingham	83%	83%
Boston	73-10%	73-10%
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74-3-10%	74-3-10%
Dallas	76%	76%
Denver	74%	74%
Detroit	74-10-10%	74-10-10%
Kansas City	74-10-10%	74-10-10%
Los Angeles	70%	76%e
Minneapolis	71-10%	71-10%
Montreal	40-10-5%bc	40-10-5%b
New Orleans	78%	76%
New York	79-10%	79-10%
Philadelphia	74-10%	76-10%
Pittsburgh	72%	72%
St. Louis	73-10-10%	72-10-10%
San Francisco	60%-25%	68%-25%
Seattle	67%	72%

Glass: *a Jobbers' list price per box, 14 x 20, ea, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality $52.75 for B quality. *b sales tax extra. *c 77% for single strength *d Discount 6/15/52. *e 77% for double strength

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*

Atlanta	$0.2615
Baltimore	.2615
Birmingham	.2665
Boston	.2615
Chicago	.2615
Cincinnati	.2615
Cleveland	.3015
Dallas	.2690
Denver	.2665
Detroit	.2615
Kansas City	.2665
Los Angeles	.2640
Minneapolis	.2665
Montreal	23.05h
New Orleans	.2665
New York	.45g
Philadelphia	.2615
Pittsburgh	.2615
St. Louis	.2665
San Francisco	.2640
Seattle	.2615

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.2065	$0.2465	$0.2615
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.2115	.2515	.2665
Rocky Mtn. States	.2115	.2515	.2665
Pacific N. W. States	.2090	.2490	.2640
Pacific S. W. States	.2065	.2465	.2615

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—2-ft. from butt	6-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.80/88	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.98
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/98	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.06
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

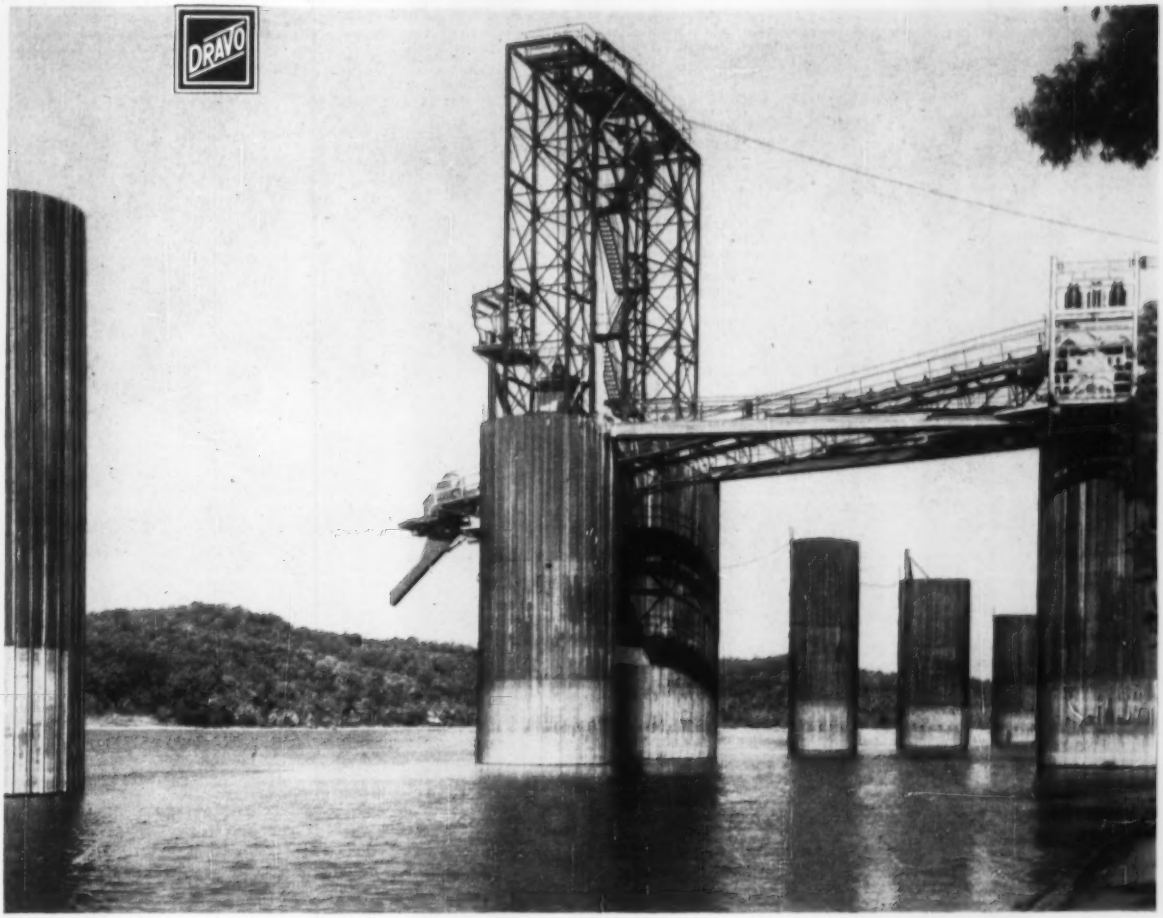
		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'8" Untr.	7" x 8" x 8'8" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$3.55	Gr. 3 $3.35	$3.33
	Grade 2	1.50	3.35	" 2 2.10	3.18
	Grade 1	1.15	3.00	" 1a 1.70	2.78
Chicago	Red Oak		4.00a		4.60a
New York	S. L. Sap Pine	2.00	4.00	3.00	6.00g
	Mixed Oak	2.90	4.50	3.50	6.50g
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.80/3.90	5.50/5.75
St. Louis	Mixed Oak	2.65	3.40a	2.90h	3.75ah
San Francisco	Douglas Fir	2.03ef	2.96ef	2.84hef	4.31ea

Tr.—Treated; Untr.—Untreated. a Creosoted. c Empty cell. e Green. f f.o.b. cars. g7 x 9 x 8' 6" * Add 75¢/tie freight charge to Birmingham. *h 7" x 9" x 9½"

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90



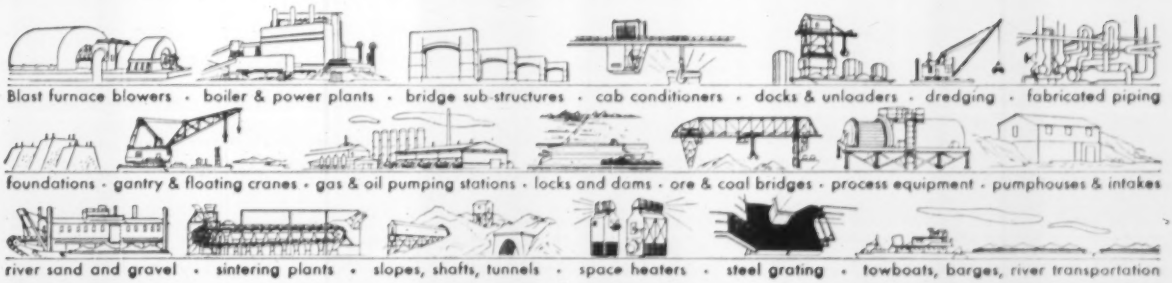
"MILLION TON" dock for new DeKoven Mine

Pittsburgh & Midway Coal Mining Company can load more than a million tons of coal annually at this modern, cellular type barge dock near Sturgis, Kentucky, on the Ohio River. A two-mile long, 42 inch conveyor belt connects the facility with the company's new DeKoven mine.

Eleven cells, three of which support the loading mechanism, are spaced along 1175 feet of shoreline. Constructed of interlocking sheets of steel piling driven to rock, each cell is filled with sand and gravel and topped with concrete. Ruggedness, economy and minimum maintenance make this an ideal type of dock for most purposes.

In the past eight years, Dravo has installed more than 100 of these docks for firms in the chemical, steel, coal, utility, railroad, petroleum and other industries. For more information on this or any of the products and services shown below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO
CORPORATION


Blast furnace blowers · boiler & power plants · bridge sub-structures · cab conditioners · docks & unloaders · dredging · fabricated piping
foundations · gantry & floating cranes · gas & oil pumping stations · locks and dams · ore & coal bridges · process equipment · pumphouses & intakes
river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ Mass., Westboro—HOSPITAL—BA 1/10—Commonwealth of Mass., Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, M-825 Admission Treatment Bldg. for State Hospital. $2,183,000. Plans deposit $1.50. Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, archts. CD 2/11.

▲† Mass., Bedford—HOUSING—BA On Or About 1/14—Contg. Officer, Air Force Cambridge Research Center, Laurence G. Hanscom Field, armed services housing project, consisting 395 family housing units at Laurence G. Hanscom Field, Inv. Bids No. 19-604-58-40. Plans deposit $100. CD 12/28/56.

BUILDINGS—SLC

▲ Me., Lewiston—HOSPITAL—St. Mary's General Hospital, 318 Sabattus St., soon lets contract, hospital addn. $2,000,000. Leo P. Probost, 61 Amherst St., Manchester, N. H., archt. CD 11/19.

HEAVY CONSTRUCTION—LB & CA

▲ NEW HAMPSHIRE—Dpt. P. Wks. & Hys., Concord,
Suburban Excavators, Inc., 4 New Salem St., Wakefield, Mass. LB $1,116,523, est. $1,400,000. hot b. conc. roadway 4-lanes, divided 1.5 mi. and 144 ft. and 190 ft. steel beam bridges, Hopkinton. Bids Dec. 5. CD 11/26.

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Bayer & Mingolla Constr. Co., Inc., P.O. Box 991, Worcester, Mass., LB $1,021,927, est. $1,160,634, relocation Section Rte. 2, FAP F-348 (3), Erving, Orange and Wendell. Bids Dec. 10. CD 12/4.

BUILDINGS—LB & CA

▲ **O'Bryan Constr. Co., Inc.,** 24 Prospect St., Brattleboro, Vt. LB $1,020,699. Union Regional JUNIOR and SENIOR HIGH SCHOOLS, site of old high school, BRATTLEBORO, VT. Union School Dist. Chn., Dist. School Bd., 96 Green St., Brattleboro, Vt. Bids Dec. 3.

▲ **Union School District,** Chrn. Distr. School Bd., 96 Green St., Brattleboro, Vt., rejected bids Dec. 3, Union Regional JUNIOR and SENIOR HIGH SCHOOLS, BRATTLEBORO, VT. LB $1,020,699. CD 12/9, under LB.

▲ **Ayres Hagan Booth, Inc.,** 35 Westminster St., Providence, R. I., CA $1,022,001, REGIONAL HIGH SCHOOL, OAK BLUFFS, MASS. Martha's Vineyard Regional High School Dist., Martha's Vineyard, Mass. Bids Nov. 15. CD 11/19, under LB.

▲ **Candlewood Terrace, Inc.,** Candlewood Shores, Brookfield, Conn., Owner Builds. $3,600,000, 300 HOUSES, "Candlewood Terrace", Carmen Hill Rd., BROOKFIELD, CONN. Donald B. MacMillan, Candlewood Shores, Brookfield, Conn., engr.

▲ **Richard B. Moore,** 2200 Main St., Glastonbury, Conn., Owner Builds. $1,700,000. 100 HOUSES "Apple Hill" GLASTONBURY, CONN. CD 4/11/56.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ Pa., Harrisburg—BA About 1/30—Harrisburg Sewage Auth., City Hall, sewage disposal plant. $8,000,000. CD 2/10/56.

BUILDINGS—BA

▲ N. Y., New York—PIER—BA 12/30—Comr. Marine & Aviation Pier L, North River, Zone 4, Contr. No. 3003, demolition and removal of Piers 37, 38, 39, 40 and 41; dredging and constr. substructure of new Pier No. 40, North River Manhattan Boro. Plans deposit $25. CD 8/15/55.

▲ N. Y., New York—HOUSING—BA 1/7—New York City Housing Auth., 299 Broadway, New York, Zone 7, (1) foundations and appurtenances (2) general construction (3) foundations and general construction (4) heating and ventilating (5) electrical work (6) plumbing for Senator Robert A. Taft Homes, (Proj. NYC-28) Section I, incl. Bldgs. Nos. 1 to 5 (inclusive) and Building W located in area bounded generally by E. 115 St., Madison Ave., E. 112 St. and 5 Ave., Manhattan Boro. Plans deposit $75. CD 4/6/55.

▲ Pa., Pittsburgh—AUDITORIUM—BA 2/12—Pittsburgh Auditorium Auth., City Hall, (1) general construction (2) plumbing (3) heating, ventilating, air conditioning and ice skating refrigeration (4) electrical (5) main roof fixed and movable (6) main roof, mechanical and electrical (7) lawns and planting (8) seeding for public auditorium with retractable dome-shaped metal roof. $16,500,000-$17,000,000. Ammann & Whitney, 111 8th Ave., New York, N. Y., designers of retractable roof. Mitchell & Ritchey, Plaza Bldg., Pittsburgh, Zone 19, archts. Corl Long, Century Bldg., Pittsburgh, electrical engr. Dzubay & Bedsole, Peoples Bldg., Pittsburgh, plumbing engrs. Robert Zern, Peoples Bldg., Pittsburgh, structural engr. (except dome roof and supporting ring girder for dome roof) Simonds & Simonds, 119 E. Montgomery St., Pittsburgh, landscape architects on site treatment. CD 10/1.

HEAVY CONSTRUCTION—LB & CA

▲ NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Brann & Stuart Co., Inc., P.O. Box 998, Trenton, N. J., CA $1,517,641, (13 bidders), constr. 3 trestle structures across Manahawkin Bay on Rte. 540 (1927), Rte. 72 (1953), Sect. 5F, Stafford Typ. and Ship Bottom Borough, Fed. Aid Proj. No. F-130(7), Ocean Co. Bids Nov. 7, awarded Dec. 10. CD 11/13.

▲ **Dravo Corp.,** Neville Island, Pittsburgh 25, Pa., CA $623,316, Contr. No. 1, substructure of bridge, incl. abutment, Monaca side and Piers 2, 3 and 4, Rochester, BEAVER, PA. Municipal Auth. of Beaver Co., Court House, Beaver, Pa. Bids Nov. 7. CD 12/9, under LB.
American Bridge Div., U. S. Steel Corp., 525 William Penn Pl., Pittsburgh 30, Pa., CA $2,787,891. Contr. 2, superstructure, roadway navigation light toll booth, toll collecting facilities, Rochester (Beaver, Pa.).

▲ **J. D. Hedin Constr. Co.,** 2900 Newton St. N.E., Wash., D. C., LB $1,809,368 (10 bidders) Contr. F.A. No. 1-03-1 (11) Southwest Freeway, 2nd St. to 4th St., grading, draining, retaining walls and underpass, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids Dec. 9. CD 12/6.

BUILDINGS—LB & CA

▲ **Flatbush Gardens,** c/o Kavy & Kavvitt, archts., 44 Court St., Brooklyn, N. Y., Owner Builds. $2,300,000. 100 HOMES in Marine Park section of Brooklyn, East 65 St., BROOKLYN, N. Y.

▲ **Wilaka Constr. Co.,** 11 E. 44 St. New York, N. Y., LB $1,533,000. foundations and general construction, Redfern HOUSES addition incl. boiler room alterations in existing Bldg. No. 2, Proj. NYS-55 in area bounded generally by Hassock St. Redfern Ave. and Bldgs. No. 5, 2, 3 and 6 of existing Redfern Houses, Queens Boro., ROCKAWAY, N. Y. New York City Housing Auth., 299 Broadway New York, 7, N. Y. Bids Dec. 10. CD 11/15.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**
PROPOSED WORK	
Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

▲ **Lakeside Village,** c/o Herman H. York, archt., 90-04 16 St., Jamaica, N. Y., Owner Builds, $1,000,000. 59 HOMES (first section) at Mohansic Ave. and White Hill Rd. west of Taconic State Parkway, YORKTOWN HEIGHTS, N. Y.

▲ **Corlies Realty Co.,** V. Robert Rund, pres., Oak Terrace, Neptune, N. J. Own Forces. $1,000,000, 95 HOUSES on new development of land to be known as Lawn Estates, Wayside Rd., NEPTUNE, N. J.

▲ **Glenwahl Constr. Co., Inc.,** Rte. 46, Saddle Brook, N. J., CA $1,121,000, general contract HIGH SCHOOL addn., PHILLIPSBURG, N. J. Bd. Educ., Phillipsburg, N. J. Awarded Nov. 29. CD-4/4.

▲ **The Wynnewood Co.,** 370 Montgomery Ave., Merion, Pa. Separate Contracts. $1,000,000, 40 unit RESIDENTIAL DEVELOPMENT, Haggsford Rd., etc., GLADWYNNE, PA.

▲ **Groomes Corp.,** P.O. Box 278, Cheswick, Pa. CA $1,173,000, 1 story, 85,000 sq. ft. floor space, brick, block JUNIOR HIGH SCHOOL, GLENSHAW, PA. School Dist. of Shaler Twp., Glenshaw, Pa. Bids Oct. 7. CD 10/17, under LB.

O. H. Martin Co., 18 First St., Sharpsburg, Pa., CA $955,000. 1 story, 100,000 sq. ft., brick, block PLANT, INDIANA, PA. Economic Planning Corp., Indiana, Pa. Fisher Scientific Co., 711 Forbes St., Pittsburgh, Pa. lessee. Franklin Douden & Assoc., Century Bldg. Pittsburgh, Pa., archts.

▲ **Bornstein & Son,** 2027 Arch St., Phila. 3, Pa., LB $1,195,000. (14 bidders) general construction JUNIOR HIGH SCHOOL for Middletown Twp. School District, PARKLAND, PA. State School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Dec. 5. CD 11/18.

▲ **Ranchland Builders Co.,** 1611 E. Wadsworth Ave., Phila., Pa., Separate Contracts, $2,500,000. 100-unit RESIDENTIAL DEVELOPMENT, Newbold Lane, PHILA., PA.

▲ **Funk Building Corp.,** 756 S. Millvale Ave., Pittsburgh, Pa., CA $1,500,000. 1 story, part bsmt., 154,075 sq. ft. brick, block SHOPPING CENTER, UNIONTOWN, PA. Town & Country Shopping Center, Inc., 300 Keystone Bldg., Pittsburgh, Pa. Bids Sept. 24. CD 9/19.

▲ **W. H. Ward Contractors,** 323 E. 25th St., Baltimore 18, Md., CA $1,125,000 1 and 3 story, brick, concrete, steel, block, Barclay Elementary SCHOOL, Barclay and 29 Sts., BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids Nov. 27. CD 12/4, under LB.

▲ **Davenport Bldg. Corp.,** attn. J. Gross, Post Office Bldg., Newark, N. J. Separate Contracts. $1,000,000, SHOPPING CENTER and parking area, NEWARK, DEL. Stanley J. Shaffel, 166-21 - 90th Ave., Jamaica, N. Y., archt.

SOUTH

BUILDINGS—BA

▲ N. C., Raleigh—HOUSING—BA 1/14—City of Raleigh Housing Auth., Halifax Court, 300 unit Walnut Terrace Housing Program. $3,000,000. Wm. H. Deitrick & Assocs. and Carter Williams,—133 Fayetteville St., archts. CD 9/14/56.

BUILDINGS—SLC

▲ Ky., Louisville—WAREHOUSE, etc.—Argonaut Realty Corp., (Gen. Motors Corp.) Argonaut Bldg., Detroit, Mich., soon lets contract 212x272x360 ft., brick, concrete slab warehouse and office bldg. (Chevrolet), on Indian Trail, near Preston St., Approx. $1,000,000.

HEAVY CONSTRUCTION—LB & CA

▲ FLORIDA—State Hy. Dpt., Tallahassee,
Dunn Constr. Co., 2508 3rd Ave., N. Birmingham, Ala., CA $1,102,347 (8 bidders) limerock base, b. conc. with binder course, wid'n. existing 135 ft. concrete structure to 4-lane roadway structures, small drainage structures, storm sewers, etc. 3.611 mi. SR 45 (Tamiami Trail) Job 1301-119 Manatee Co. Bids Oct. 24, awarded Dec. 5. CD 11/18, under LB.

▲† **Pavarini & D. L. Prager,** 801 2 Ave., New York 17, N. Y. U. S. A., LB $1,455,000, Item No. 1; LB $1,343,000, Item No. 2; LB $1,454,000, Item No. 5. (9 bidders), station facilities, NBy 10335, Spec. 10335/57, ANTIGUA ISLAND, B.W.I. Office of Resident Officer in Charge of Constr., Bureau of Yards & Docks Contract, 245 Alcazar Ave., Coral Gables, Fla., U. S. A. Bids Nov. 29. CD 11/26;
Nat G. Harrison, Jr. & Assocs., 5137 N.E. 2 Ave., Miami, Fla., U. S. A., LB $1,107,450, Item No. 3; LB $1,424,850, Item No. 4; LB $1,420,750, Item No. 6, station facilities, NBy 10335/57, (Antigua Island, B.W.I.).

▲ **Pecon Corp.,** 167 Almeria Ave., Coral Gables, Fla., and **John C. Peterson Constr. Corp.,** 958 Church St., Baldwin, N. Y., CA $2,404,363, grading, paving and utilities, Miami International Airport, MIAMI, FLA. Bd. Comrs. Dade Co., Court House, Miami, Fla. Awarded Dec. 4. CD 11/27, under LB.

(Continued on page 64)

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(Continued From Page 62)

Pittman Constr. Co., Inc., P.O. Box 8116, New Orleans 22, La. LB $969,900. (3 bidders), Project La. 4-4, Low-Rent HOUSING, LAKE CHARLES, LA. Lake Charles Housing Auth., Lake Charles, La. Bids Dec. 5. CD 11/14.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Tenn.—**Burns & Baker,** Third Natl. Bank Bldg., Nashville, Tenn. CA $728,962. constr. crushed stone base and paving with bit. materials (plant mix) section of State Rte. No. 1, 3.406 mi. beginning at Vaugh's Gap near Bellevue and extending eastward across Nine Mile Hill to the N.C. and St. L. Overhead near jct. of State Rte. No. 100, Proj. F-001-4 (25), Davidson Co.;

Tenn.—**Nello L. Teer Co.,** Trust Bldg., Durham, N. C. CA $2,370,163. crushed stone and bit. materials (plant mix), paving and constr. 6 bridges 6.672 mi. section of State Rte. No. 73-A, Proj. F-056-1 (17), Blount Co.;

Tenn.—**Walker Constr. Co.,** 2313 Deerwood Dr., Nashville, Tenn., CA $584,104. constr. soil-cement-base, surf. with bit. materials and constr. 4 concrete box type bridges on section of relocated State Rte. No. 20 10.578 mi., Proj. No. F-020-2 (10) Crockett Co.;

Tenn.—**Wesco Constr. Co.,** Airport Rd., Chattanooga, Tenn. CA $622,674. crushed stone and bit. materials (plant mix) paving 2 lanes of 4-lane section of State Rte. No. 2, Proj. F-002-3 (24) Hamilton Co., wid'n. existing roadway and drainage structures and paving with crushed stone and bit. materials (plant mix) 2.47 mi. section of Interstate Rte. 502, Proj. I-502-(4), Hamilton Co.;

Tenn.—**A. B. Long Constr. Co.,** Harriman, Tenn. CA $3,789,626. c. conc. paving and constr. 11 bridges (5 conc. box type and 6 concrete deck girders) 2.382 mi. section of Interstate Rte. No. 507 in Knoxville, Proj. I-507 (3), Knox Co.;

Tenn.—**Ralph Mills Co.,** 410 Ann St., Frankfort, Ky. CA $948,359. crushed stone and bit. materials (plant mix) paving and constr. concrete parking lanes, curbs and sidewalks 0.214 mi. on section of State Rte. No. 9 in Knoxville, Proj. U-009-2 (7), Knox Co.; crushed stone and bit. materials (plant mix) paving, constr. concrete parking lanes, curbs and sidewalks, wid'n pedestrain underpass bridge and constr. concrete, steel bridge 0.99 mi. for interchange at jct. of State Rte. No. 1 and 9 on section of State Rte. No. 1 on Knoxville, Proj. U-001-8 (15), Knox Co.;

Tenn.—**Oman Constr. Co., Inc.,** Acklen Park, Nashville, Tenn. CA $502,772 with crushed stone and bit. materials (plant mix) paving and constr. concrete parking lanes, curbs, sidewalks, storm sewage sys. and 1 concrete box type bridge 1.694 mi. on section of State Rte. No. 10 in Murfreesboro, Proj. UF-010-3 (6), Rutherford Co. Bids Nov. 27. Grand total $9,546,560. CD 12/4, under LB.

BUILDINGS—LB & CA

▲ **Doyle & Russell,** Central National Bank Bldg., Richmond, Va. CA $1,500,000. WAREHOUSE, 150,000 sq. ft. shipping docks, RICHMOND, VA. Richmond Food Stores, Inc.,* 2522 Hermitage Rd., Richmond, Va. Bids Nov. 20. CD 10/30.

▲ **J. A. Jones Constr. Co.,** 133 Ellis St. N.E., Atlanta, Ga. CA $1,059,300. 3 women's DORMITORIES, ATLANTA, GA. Emery University, G. H. Mew, treas., City Office, Candler Bldg., Atlanta, Ga. Bids Nov. 19. CD 12/2, under LB.

▲ **The Coite Somers Co.,** Vidalia, Ga. LB $2,308,000. Low Rent HOUSING, GA 1-6, incl. 275 dwelling units, AUGUSTA, GA. Augusta Housing Auth., 2100 Broad St., Augusta, Ga. Bids Nov. 26. CD 11/7.

▲ **Farnsworth & Chambers,** Box 332, New Orleans, La. CA $1,998,891. 3 story, 112,000 sq. ft. concrete frame, brick, concrete block UNIVERSITY CENTER BUILDING, NEW ORLEANS, LA. Tulane University, 6823 St. Charles Ave., New Orleans, La. Bids Nov. 14. CD 11/22, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 8 Michigan

STREETS AND ROADS

January 8 Michigan

▲ Ill., Chicago—BA 12/26—City, Halsted St. interchange, ramp structure over Congress St. Expressway $2,000,000. CD 10/21.

▲ Ill., Chicago—BA 12/27—Chicago Park District, 425 E. 14 Blvd., paving and underground work Austin Blvd. from Lake St. to Roosevelt Rd. Chicago and Oak Park, $1,000,000. CD 5/16/56.

▲† Indiana and Illinois—BA 1/7—U. S. Eng., Merchandise Mart., Chicago 54, Ill., water treatment facilities and shallow wells at special AAA sites in Porter Co., Ind. and Cook Co., Ill. $1,000,000.

▲ O., Mansfield—BA 1/16—City, City Hall, sewage disposal plant, Contr. 3, complete activated sludge treatment plant, incl. screen chamber, preparation, primary tanks, aeration tanks, final tanks, sludge thickening tanks, digesters, etc. $4,024,746. Plans deposit $50. Floyd G. Browne & Assocs., 125 W. Church St., Marion, engrs. CD 8/29.

BUILDINGS—BA

▲ Ill., Chicago — SCHOOL — BA 12/23 — Bd. Educ., 228 N. LaSalle St., 2 story, brick Henry Suder Elem. School, Washington and Leavitt Sts. $1,000,000. CD 12/1/55.

▲ Mich., Lansing—HOSPITAL—BA 1/9—McLaughlin Osteopathic Hospital, Frank McPherson, admin., 120 East Lenawee, Lansing, hospital, $1,000,000. Plans deposit $20. Clark R. Ackley, 1811 East Michigan Ave., archt. CD 10/31.

▲ O., Indian Hill—SCHOOL—BA 1/14—Indian Hill School Dist., Drake Rd., elementary school. $1,300,000. Plans deposit $25. Potter, Tyler, Martin & Roth, 128 E. 6th St., Cincinnati, archts. Richluen, 9394 Montgomery Rd., Montgomery, engr. CD 8/14/57.

▲ Ill., Alton—HOSPITAL—BA 1/29—St. Anthony's Hospital (Sisters of St. Francis of Martyr St. George) Mother M. Agatha, admin., Alton, 5 story wing to house 72-beds, masonry, rein.-con. frame, hospital, new boiler plant, laundry and food facilities. $1,641,000. A. E. Crawford Co., 6552 Clayton Rd., Richmond Heights 17, Mo., mech. engrs. and Joseph A. Mayer Co., 8147 Delmar Blvd., University City 24, Mo., electrical engrs. Drake, O'Meara Assocs., 212 S. Bemixton Ave., Clayton, Zone 5, structural engrs. archts. CD 11/11.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—Dpt. Hys., Columbus, Zone 15,

O.—**J. A. Jones Constr. Co.**, Charlotte, N. C., Box 18, Berlin Heights, O., CA **$3,105,291**, est. $3,442,200 (7 bidders) Type T-71, SR 1-249-, 1-1103 (25) 6.555 mi. Ashtabula Co.; CA **$3,757,253** est. $4,152,000, (6 bidders) Type T-71 and structures, SR 1-0100 524, 1-1105 (22) 3.95 mi. Medina and Wayne Counties;

O.—**The Horvitz Co.**, 4375 E. 146th St., Cleveland, O., CA **$6,019,273**, est. $6,536,500, Type T-71, USR 42 (17 43-18-02) 1-1057 (5), (City of Cleveland) 1.326 mi., Cuyohoga Co.;

O.—**Maxon Constr. Co., Inc.**, 2600 Far Hills Ave., Dayton, O., CA **$2,852,260**, est. $3,127,500, Type T-71 and structures, SR 1-15.82, 0.00, 1-1105 (10), 6.109 mi. Delaware and Morrow Counties;

O.—**Wander & Mason, Inc.**, 1028 Proprietors Rd., Worthington, O., CA **$3,399,692**, est. $3,612,000, Type T-35 and B-70, USR 62 (12.56, SR 3-(13.70) 1-609 (City of Columbus) 2.227 mi., Franklin Co.;

O.—**The Baker & Hickey Co.**, 2170 Eakin Rd., Columbus, O., CA **$2,568,006**, est. $2,916,000, Type T-35, on B-70 and structures, USR 23DA 1.14 U-UG-1056 (1) 1-599 (9) (city of Columbus) 0.852 mi., Franklin Co.;

O.—**The Penker Constr. Co.**, 1030 Summer St., Cincinnati, O., CA **$4,882,016**, Type T-71 and structures, SR 4W, Section 7.16, SR 562, 0.28, 1-316 (6) U-1096 (1) (City of Cincinnati, City of St. Bernard and the Village of Elmwood Place), Hamilton Co.;

O.—**Ralph Meyers Contg. Corp.**, P. O. Box 230, Salem, Ind., CA **$2,953,654**, est. $3,229,100, Type T-71 and structures, USR 40-24.70, 1-529 (14) 4.812 mi., Licking Co. Grand total $25,780,192. CD 12/5/57, under LB.

▲ **Acme Constr. Co.**, Box 257, Solon, O., LB **$1,617,974** (12 bidders) Bridge Creek Reservoir and Dam, incl. concrete-earthen breastwork of dam, almost 1 mi. long, 35 ft. high, 300 ft. thick at base to impounding 15 billion gals. over 1,500 acres, Geauga County, AKRON, O. City, Leo Walter, serv. dir., City Hall, Akron, O. Bids Dec. 2. CD 10/24.

▲ **Acme Constr. Co.**, Box 257, Solon Village, (Cleveland, P.O.) O., LB **$1,617,947** (12 bidders) bridge, AKRON, O. City, Leo G. Walter, service dir., City Hall, Akron, O. CD 7/13/55.

▲ ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield,

Paschen Constr., Inc., 2739 N. Elston St., Chicago, Ill., CA **$1,094,115**, 4 span grade separation East Ave. over Congress St. Expressway in Oak Park, Cook Co. Bids Nov. 22, awarded Dec. 3. CD 11/26, under LB.

▲ ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

Louis Scully & Sons, 6127 N. Hiawatha, Chicago, Ill., CA **$1,689,875**, 5.56 mi. storm sewer on 95th St. (U. S. Routes 12 and 20) between Western and Cicero Aves. and on Cicero Ave. (Ill. Rte. 50) between 95th and 115th Sts. in and near Evergreen Park, Oak Lawn and Alsip, Sect. 3239B-X-T, Proj. U-141 (16) and U-245 (18), F. A. Routes 99 and 121 (Marked Ill. Route 50 and U. S. Routes 12 and 20), Dist. 10, Cook Co. Bids Nov. 22, awarded Dec. 3. CD 11/26, under LB.

BUILDINGS—LB & CA

▲ **Z. M. P. Realty Co.**, 5675 Turney Rd., Garfield Heights, O., Own Forces, **$1,000,000**, 12-store addn. to existing Turneytown SHOPPING CENTER, GARFIELD HEIGHTS, O. Damon, Worley Samuels & Assocs., Engineers Bldg., Cleveland 14, O., archts.

▲ **E. B. Badger Co.**, 75 Pitts St., Boston, Mass., CA **$8,000,000**, oil dewaxing plant addn., EAST CHICAGO, IND. Sinclair Refining Co., 3500 Indianapolis Blvd., East Chicago, Ind. CD 12/11.

▲ **S. N. Nielsen Co.**, 3059 N. Augusta Blvd., Chicago, Ill., LB **$10,339,000**, 6 APARTMENT BLDGS., 855 units, COMMUNITY CENTER BLDG., MANAGEMENT MAINT. BLDG., BOILER PLANT, Rockwell Gardens, bounded by Madison, Van Buren, Western and Rockwell Sts., CHICAGO, ILL., Chicago Housing Authority, 608 S. Dearborn St., Chicago, Ill. CD 10/28.

▲ **S. N. Nielson Co.**, 3059 W. Augusta Blvd., Chicago, Ill., CA **$3,100,000**, 3 story LAW SCHOOL BLDG., asphaltic conc. paving, 58th and Woodlawn Ave., CHICAGO, ILL. University of Chicago, 5801 S. Ellis Ave., Chicago, Ill. CD 1/25/56.

▲ **Hutter Constr. Co.**, 134 Western Ave., Fond du Lac, Wis., LB **$1,663,552** (5 bidders) general contract - HOSPITAL addns. and remodel, PORT WASHINGTON,

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• AKRON, IND. • LONGVIEW, TEXAS

BRANTFORD, ONT. • MEXICO, D. F.

Wis. St. Alphonsus Hospital, 743 N. Montgomery St., Port Washington, Wis. Bids Dec. 4. CD 11/12.

Robert P. Gunz, 25 Jackson Dr., Oshkosh, Wis., LB $355,534 (5 bidders) heating, ventilation and air-conditioning (Port Washington, Wis.).

▲ **A. J. Etkin Constr. Co.**, 10111 Capital, Oak Park, Mich., CA $1,500,000, total est. with equip. $4,500,000, PLANT, produce and ship gypsum; contract includes crushing, screening plants conveyor sys., loading docks, offices, TAWAS CITY, MICH. National Gypsum Co., 16641 East Warren, Detroit, Zone 24, Mich.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **Iowa, Estherville**—HOSPITAL—BA 1/15—Holy Family Hospital, Estherville, 4 story, bsmnt., 50 bed hospital addn. $1,300,000. Hills, Gilbertson & Hayes, 6009 Wayzata Blvd., Minneapolis, Minn. CD 11/19, under LB.

▲ **Colo., Fort Collins**—PLANT SCIENCE BLDG.—BA 1/28—Colorado A & M College, Fort Collins, constr. 1 and 2 story, brick, steel Plant Science Bldg. $1,035,000. James M. Hunter, 1126 Spruce St., Boulder, archt.-engr. CD 11/28/55.

▲ **Neb., Omaha**—STUDENT UNION, etc.—BA 1/29—University of Omaha, 60 and Dodge Sts., student union bldg. $950,000, CD 1/17/56; applied arts bldg. $650,000. CD 1/16/56. John Latenser & Sons, 1307 Farnam St., archts.

BUILDINGS—SLC

▲ **Kan., Kansas City**—STORE—J. C. Penney Co., Postal Life Bldg., Kansas City, Mo., soon lets contract retail store, $1,000,000. Elswood, Smith & Carlson, 5920 Nall Mission, Kan., archts. CD 8/12.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, **Cameron Joyce Co.**, Keokuk, Iowa, CA $1,520,229, 24 ft. c. conc. 16.079 mi. Lafayette Co. Bids Nov. 27. CD 11/14.

▲ **Westinghouse Electric Corp.**, Box 868, Pittsburgh 30, Pa., CA Est. $10,000,000, 300,000 kw turbine factual operating capacity about 335,000 kw), ST. LOUIS, MO. Union Electric Co., 315 N. 12 Blvd., St. Louis, Zone 1, Mo.

KANSAS—Kansas Turnpike Authority, Box 3002, Wichita, Zone 18.

List & Weatherly Constr. Co., 424 Nichols Rd., Kansas City, Mo., LB $918,895, est. $1,020,086 (6 bidders), six bridge structures on 18th St. Expressway which joins Kansas Turnpike, Kansas City, Kan. Howard, Needles, Tammen & Bergendoff, 1805 Grand St., Kansas City, Mo., engrs. Bids Dec. 6. CD 9/30/54.

▲ **Douglas Constr. Co.**, 510 E. 15 St., Topeka, Kan., CA $2,657,960, Proj. 1, water plant imprvs., TOPEKA, KAN. City, City Hall, Topeka, Kan. Bids Nov. 12. CD 12/3, under LB.

BUILDINGS—LB & CA

▲ **J. E. Dunn Constr. Co.**, 929 Holmes, Kansas City, Mo., LB $1,523,066 (3 bidders), Chouteau Court HOUSING, 2 and 3 story, 20 buildings, KANSAS CITY, MO. Kansas City Housing Authority, Joseph Brady, dir., 1220 Independence Ave., Kansas City, Mo. Bids Dec. 10. CD 11/15.

Bob Eldridge Constr. Co., 3206 Strong Ave., Kansas City, Kan., CA $976,611, est. $417,000, 3 story, ground floor, 161x261 ft., 35 classrooms, MUSIC & APPLIED ARTS BUILDING, WARRENSBURG, MO. Central Missouri State College, Bd. Regents, Warrensburg, Mo. Bids Nov. 1. CD 11/14, under LB.

▲ **M. W. Watson**, National Bank of Topeka Bldg., Topeka, Kan., CA $1,188,000, general contract PATIENTS TREATMENT UNIT at Topeka State Hospital, TOPEKA, KAN. State, Dpt. Admin., State House, Topeka, Kan. Bids Nov. 26. CD 11/14.

▲ **Metropolitan Constr. Co., Gill Constr. Co., Cowen Constr. Co.**, P. O. Box 3868, Oklahoma City, Okla., CA $4,341,000, 268-unit family Capehart HOUSING units, Tinker Field, IFG 34-60-58-130, OKLAHOMA CITY, OKLA., U. S. Govt., Contg. Officer, FCPIF, Family Housing Proj. Office, Depot Procurement Div., Tinker Field, Oklahoma City, Okla. Bids Oct. 30. (Correction—name of low bidder). Awarded Dec. 10. CD 11/13.

▲ **H. A. Lott, Inc.**, c/o Wirtz, Calhoun, Tungate & Jackson, archts., 2506 Richton St., Houston, Tex., CA $1,281,700, remodeling 5 story BUILDING for WOMEN and 5 story BUILDING for MEN, 3 story GIRLS' APARTMENT, 2 and 3 story DORMITORY for women, four 2-story men's co-operative HOMES at College, HUNTSVILLE, TEX. Sam Houston State Teachers College, Huntsville, Tex. Bids Nov. 21. CD 11/29, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 9 California
STREETS AND ROADS
January 8, 9 California

BUILDINGS—BA

▲ **Ore., Portland**—HOTEL—BA 1/6—Sheraton Corp., 212 Wood St., Pittsburgh, Pa., 8 story hotel, $5,000,000. Church, Newberry, Roehr & Schuette, Builders Exchange Bldg., Portland, Ore., and Perry, Shaw Hepburn & Dean, Park Sq. Bldg., Boston, Mass., archts. CD 4/11.

▲ **Calif., Newport Beach**—HOSPITAL—BA 1/8—Hoag Memorial Hospital, 301 Newport Blvd., 4 story reinf.-con. hospital, $1,000,000. Chambers & Hibbard, 124 W. 4 St., Los Angeles, archts. CD 10/1/56.

▲ **Calif., Oakland**—OFFICE—BA 1/31—Henry J. Kaiser, 1924 Webster St., (selected list of bidders) 25 story, 3 bsmnts., rein.-con. 850,000 sq. ft. Kaiser Center Office Bldg. $17,000,000. Welton Beckett & Assocs., 5657 Wilshire Blvd., Los Angeles, archts. CD 5/10/56.

▲ **Ore., Portland**—HOSPITAL—BA 2/1—Kaiser Foundation, 2606 Northeast Broadway, 6 story hospital, $3,500,000. Wolff & Zimmer, Pearson-Fourth Ave. Bldg., archts. CD 6/11.

HEAVY CONSTRUCTION—LB & CA

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City, bids opened 12/3,

Utah—**Tiago Constr.** 3399 S. 2nd W., Salt Lake City, Utah, LB $1,351,505, grading, draining 4.493 mi. Interstate Hy. 15 from 1.3 mi. south of 6500 S. St. in North Salt Lake City to 0.2 mi. north of Page Lane Fed. Aid Proj. No. 1-01-7 (2) 1st Contract Davis Co.

Utah—**Whiting & Haymond**, Springville, Utah, LB $308,472. 2½ in. road mix bit. surf. on State Rd. 54 between East Boundary of Bryce Canyon National Park and Cannonville 7.236 mi. 2 concrete structure over 20 ft. span, Fed. Aid Proj. No. Secondary S-0392 (2) and State Proj. No. 1592, Garfield Co. CD 10/10.

▲ **OREGON**—Oregon Hy. Comn., Hy. Bldg., Salem,

Ore.—**Arthur Simonson**, 2925 Grandview, Baker, Ore. CA $93,736 (11 bidders) Contr. No. FAP S-128(2) 3.46 mi. grading and oiling, Wingville Lane Rd., Baker Co.;

Ore.—**Peter Kiewit Sons, Co.**, Medford, Ore., CA $1,056,025 (13 bidders) Contr. No. BF-124 (11) 4.16 mi. grading Oregon Coast Hy., Cape Ferrelo-Brookings, Curry Co.;

Ore.—**Earl L. McNutt**, 3511½ E. Broadway, Eugene, Ore., CA $146,440 (17 bidders) Contr. FAP S-363 (1) 1.02 mi. grading and oiling, Forest Boundary-Tiller Rd., Douglas Co.;

Ore.—**Rogers Constr. Co.**, 11760 N.E. Glissan St., Portland, Ore., CA $417,478 (12 bidders) Contr. FAP S-49 (3) 19.9 mi. grading and 26.06 mi. stone base and oiling Wasco-Heppner Hy., Gilliam Co.;

Ore.—**M. C. Lininger & Sons**, Box 1386, Medford, Ore., CA $106,850 (5 bidders) Contr. FAP US-217 (4) .79 mi. grading and paving, Jackson Co.;

Ore.—**Kuckenberg Constr. Co.**, 11104 N.E. Holman St., Portland, Ore., CA $1,142,973 (10 bidders) Contr. No. FAIP 1-303 (21) 2.7 mi. grading, Lowell St.-21st Ave. unit, Baldock freeway, Multnomah Co.;

Ore.—**Inland Constr. Co.**, 6202 S. E. Harmony Rd., Milwaukie, Ore., CA $127,684 (22 bidders) Contr. No. FAIP 1-248 (18) 301 (9) 3 structures near Troutdale, Columbia River Hy., Multnomah Co.;

Ore.—**Earl L. McNutt Co.**, 3511½ E. Broadway, Eugene, Ore., CA $292,886 (18 bidders) Contr. FAP S-49 (4) 5.22 mi. grading and 8.24 mi. oiling, Wasco-Heppner Hy., Sherman Co.;

Ore.—**Warren Northwest, Inc.**, Box 5072, Portland, Ore., CA $260,759 (4 bidders) Contr. FAP F-183 (12) 1.81 mi. grading 1.18 mi. paving and 1.15 mi. shoulder oiling, Tuslatin Valley Hy., Washington Co. Grand total $3,644,831. Bids Dec. 5.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento. Bids opened 12/11,

Gordon H. Ball, 300 Camille Ave., Danville, Calif. LB $2,576,412 (14 bidders) grading, 13.6 mi. 2 lane hy. and constr. 9 structures incl. 599 ft. bridge over Cache Creek and 419 ft. bridge over Putah Creek on State Hy. Rte. 90, Sunnigan-Vacaville Cutoff, Yolo and Solano Counties. CD 11/13.

▲ **Ukropina-Polich-Kral**, 201 E. Las Tunas Dr., San Gabriel, Calif. LB $5,270,648 (10 bidders) constr. 12 mi. pipe line second San Diego Aqueduct near Temecula, Riverside Co., LOS ANGELES, CALIF. Metropolitan Water Dist., 306 W. 3 St., Los Angeles, Calif. Bids Dec. 4. CD 11/11.

BUILDINGS—LB & CA

▲† **Sierra Constr. Co.**, Box 2281, Huntridge Station Las Vegas, Nev. CA $2,058,325, 30,000 sq. ft. MECHANICAL ASSEMBLY BLDG. GUARDHOUSE, WAREHOUSE and OFFICE, grading, paving, small amount railroad track at Jackass Flats, MERCURY, NEV. Atomic Energy Comn., 1235 S. Main St., Las Vegas, Nev. CD 12/5, under LB.

▲ **Acron Investments, Inc.**, 8730 Los Coyotes Dr., Buena Park, Calif. Owner Builds. $1,601,856, 74 frame, stucco DWELLINGS in tract 3111, BUENA PARK, CALIF.

▲ **Bob Long Constr. Co.**, Box 1623 Fresno, Calif. LB $1,890,000 combined base bid (7 bidders) Sierra JUNIOR HIGH SCHOOL, Cedar and Garland Ave. and Wm. J. Cooper JUNIOR HIGH SCHOOL, Hughes and Ashlan Aves., FRESNO, CALIF. Fresno City Unif. School Dist., c/o Supt., 2348 Mariposa St., Fresno, Calif. Bids Dec. 3. CD 11/20.

▲ **Morley Constr. Co.**, 7700 Sunset Blvd., Los Angeles, Calif. LB $2,319,000 (7 bidders) Mifikan JUNIOR HIGH SCHOOL North Hollywood, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Dec. 4. CD 11/11.

▲ **Acme Constr. Co.**, 827-13th St., Modesto, Calif. LB $1,322,509 (4 bidders) JUNIOR HIGH SCHOOL, Yosemite and San Juan Sts., PITTSBURG, CALIF. Pittsburg Unif. School Dist., c/o Supt., 2000 Railroad Ave., Pittsburg, Calif. Bids Dec. 3. CD 11/14.

▲ **The Pacific Coast Builders**, 1 South Park St., San Francisco, Calif., CA $1,289,700, new JUNIOR HIGH SCHOOL, Yosemite and San Juan Sts., PITTSBURG, CALIF. Pittsburg Unified School Dist. 2000 Railroad Ave., Pittsburg, Calif. Bids Dec. 3. CD 12/10, under LB.

▲ **Barrett Constr. Co.**, 1800 Evans St., San Francisco, Calif., LB $2,927,400 (7 bidders) Base Bid, general constr. 134 bed HOSPITAL addn. at Sequoia Hospital, REDWOOD CITY, CALIF. Sequoia Hospital Dist., c/o Bd. Directors, Whipple Ave. and Alameda de Las Pulges, Redwood City, Calif. Bids Dec. 4. CD 10/23.

▲ **Elmer J. Freethy**, 1432 Kearny St., El Cerrito, Calif., CA $1,155,770, Adams JUNIOR HIGH SCHOOL, Loring and Rosalind Sts., RICHMOND, CALIF. Richmond City Elementary & Richmond Union High School Dist., 1108 Bissell Ave., Richmond, Calif. Bids Nov. 27, awarded Dec. 5. CD 12/4, under LB.

▲ **F. P. Lathrop Constr. Co.**, 800 University Ave., Berkeley, Calif. CA $1,000,000, 116,000 sq. ft. PLANT, SAN LEANDRO, CALIF. United Centrifugal Pumps, 580 2nd St., Oakland, Calif. CD 3/20.

▲ **Williams & Burrows**, 500 Harbor Blvd., Belmont, Calif. LB $2,000,000, WINERY, on 17 acre site off Saratoga Ave., incl. 2 bldgs. (1) 11,000 sq. ft. reception room and wine tasting hall (2) 121,600 sq. ft. bldg. for processing wine, SARATOGA, CALIF. Paull Masson Vine Yards, 1256 Market St., San Francisco, Calif. Bids Nov. 27. CD 11/7.

▲ **Crown Constr. Co.**, 5059 W. Pico Blvd., Los Angeles 59, Calif., CA $1,086,526, GYMNASIUM, at South High School, TORRANCE, CALIF. Torrance Unified School Dist., 2335 Plaza del amo, Torrance, Calif. Bids Nov. 21. CD 12/4, under LB.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 27 Manitoba
STREETS AND ROADS
January 8, 22 Ontario

▲ **N. S., Halifax**—TERMINAL BLDG.—BA 1/16—Dpt. Transport, Hunter Bldg., Ottawa, Ont., constr. 2 story, 1,250 ft. long, International Air Terminal Bldg. at Airport, Kelly Lake. $2,000,000. Gilleland & Strutt, 304 Laurier Ave. W., Ottawa, Ont., archts. C. D. Davis & Co., 95 Dresden Rd., Halifax, assoc. archts. CD 12/10.

BUILDINGS—BA

▲ **Ont., Toronto**—AUDITORIUM—BA 1/8—O'Keefe Auditorium, 285 Victoria St., 2 story, limestone, granite and glass base, sculptural form roof sheathed in bronze and granite, stage tower 100 ft. high, limestone slab, on 2½ acre, auditorium, Yonge and Front Sts. $10,000,000. Eggers & Higgins, 78 United Nations Bldg., New York, N. Y., U. S. A., archts. Earle C. Morgan, 709 Church St. and Page & Steele, 72 St. Clair St., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **Pigott Constr. Co. Ltd.**, 1250 Bay St., Toronto, Ont. LB $4,459,000. (6 bidders), sewerage treatment plant, north of Queen St., extension on west bank of Humber River, constr. proposed main bldg., digestion tanks and related structures, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. D. E. Kertland, 36 Summerhill Gardens, Toronto, Ont., archt. James F. MacLaren Assocs., 321 Bloor St. E., Toronto, Ont., engrs. Bids Nov. 25. CD 10/10.

BUILDINGS—LB & CA

▲ **Canadian Bechtel Ltd.**, 25 King St. W., Toronto, Ont. CA Est. $17,000,000. REFINERY expansion, incl. powerformer, catalytic cracker and an atmospheric and vacuum distillation unit to increase refiner's capacity over 80%, CALGARY, ALTA. Imperial Oil Ltd., 111 St. Clair Ave. W., Toronto, Ont.

▲ **Canadian Bechtel Ltd.**, 540 Burrard St., Vancouver, B. C. CA $2,250,000, EQUIPMENT and STORAGE FACILITIES, to increase existing crude oil capacity of plant from 24,800 to 32,100 bbl. per day, IOCO, B. C. Imperial Oil Ltd., 1080 Granville St., Vancouver, B. C. Awarded Dec. 5. CD 12/9.

▲ **G. H. Wheaton Ltd.**, 3256 Cambie St., Vancouver, B. C. LB $1,811,624, Sir Charles Tupper Secondary SCHOOL, 23rd and Prince Edward, VANCOUVER, B. C. Vancouver School Bd., 1595 W. 10th Ave., Vancouver, B. C. E. D. King, 1595 W. 10th Ave., Vancouver, B. C., archts. Bids Nov. 25. CD 10/25.

▲ **Magil Constr. Ltd.**, 410 Gratton St., St. Laurent, Que. (7 bidders) Approx. $1,100,000, HIGH SCHOOL and GYMNASIUM, 38 teaching areas, rein.-con. frame, brick and exposed exterior, BEACONFIELD, QUE. Protestant School Bd. of Pointe Claire and Beaconsfield, 17 Cedar Ave., Pointe Claire, Que. Bids Oct. 29, awarded Dec. 3. CD 10/16.

▲ **Webster-Smallwood Ltd.**, 192 King St., Midland, Ont. CA Est. $1,000,000, 1 and 2 story, mezzanine 102 x 210 ft. PLANT, concrete fdn., masonry walls, structural steel frame, concrete floors in factory and office, MIDLAND, ONT. Pillsbury of Canada Ltd., 206 King St., Midland, Ont. Halsall & Dowdell, 752 A Yonge St., Toronto, Ont., engrs. Awarded Nov. 29.

▲ **Canada Constr. Co. Ltd.**, 23 Taber Rd., Rexdale, Ont. SA Est. $1,000,000. LABORATORY ADMINISTRATION BLDG., for Ontario Water Resources Comn., Etobicoke, (Toronto suburb), TORONTO, ONT. Dpt.

P. Wks., for Ontario, Parliament Bldgs., Toronto, Ont. Fisher, Tedman & Fisher, 623 Sherbourne St., Toronto, Ont., archts. Wallace, Carruthers & Assocs., Ltd., 92 Yorkville Ave., Toronto, Ont., engrs. Awarded Dec. 2.

▲ **Perini Ltd.**, 49 Jackes Ave., Toronto, Ont. CA $1,000,000. 10 story penthouse, 80x160 ft., rein. con., poured concrete fdn., flab slab floors, precast, aggregate panels OFFICE BLDG., 150 Eglinton Ave. E., TORONTO, ONT. Radlay Investment Ltd., c/o A.E. LePage Ltd., 2239 Yonge St., Toronto, Ont. Page & Steele, 72 St., Clair Ave. W., Toronto, Ont., archts. Farkas & Barron of Canada Ltd., Adelaide St. E., Toronto, Ont., engrs.

▲ **Anglin-Norcross, Quebec, Ltd.**, 892 Sherbrooke St. W., Montreal, Que., CA $5,000,000, 9 story MEDICAL BLDG., rein.-con. fdn. with frame, stone exterior to provide about 192 beds and a 53 bed children's ward, MONTREAL, QUE. Bd. of Governors, Royal Victoria Hospital, Pine Ave. W., Montreal, Que. Barott, Marshall, Merrett & Barott, 1425 Mountain St., Montreal, Que., archts. Bids Oct. 30, awarded Dec. 6. CD 10/14.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **E. G. M. Cape & Co.**, 1500 Martngr. St., Toronto, Ont., and **Velutini & Bergamin, C.A.**, Caracas, Venezuela, LB $39,753,692, 364 ft. high irrigation and power dam on Bocono River in southwestern part of VENEZUELA. Ministry of P. Wks., Caracas, Venezuela. J. R. Tipton Associated Engineers, Insurance Bldg., Denver, Colo., U.S.A., consult. engrs.

FOREIGN

BUILDINGS—LB & CA

▲ **Nuclear Power Co.**, London, England, CA Est. $80,000,000. nuclear POWER PLANT in southern ITALY. Agip Nuclear (Govt. of Italy) Rome, Italy. CD 11/28/56.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Calif., Benecia**—City, City Hall, sewerage system, $1,200,000. Brown & Caldwell, 66 Mint St., San Francisco, consult. engrs. CD 11/27.

▲ **Conn., Greenwich**—Town, Town Hall, sewer tunnel in Byram, $1,200,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs.

▲ **Conn., Riverside**—Town of Greenwich, Town Hall, Greenwich, plans by Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., sewerage system, $2,500,000. CD 7/25.

▲ **Mich., Madison Heights**—City, Myrtle Chamberlain, clk., 26303 John R. St., bond election Dec. 9, sewer constr. $1,500,000. James Salle, Madison Heights, city engr.

▲ **Mich., Saginaw**—City, C. A. Miller, mgr., City Hall, voted $3,900,000 bonds Nov. 7, relief sewers. CD 9/27.

▲ **O., Cincinnati**—City, City Hall, and Hamilton Co., 300-ton city-county incinerator, Este Ave. $1,500,000. Geo. Lemmel, co. engr. and T. J. Montgomery, city engr. CD 11/5/54.

▲ **Pa., Ambler (P.O. Montgomery)**—Upper Dublin Twp. Comrs., Ambler, sewage disposal plant. $1,000,000. Albright & Friel, Inc., 3 Penn Central Plaza, Phila., consult. engr.

▲ **Ont., Tillsonburg**—Town, Town Hall, trunk sewers and disposal plant, $1,000,000. R. V. Anderson & Assocs. Ltd., 194 Wilson Ave., Toronto, consult. engrs. CD 8/6/56.

BRIDGES

▲ **Kan., Topeka**—City, City Hall, and Pawnee Co., Sardou Bridge. $1,426,000. Finley & Turnipseed, 603 Topeka St., engrs. Bids in January.

▲ **N. Y., Buffalo**—City, Dpt. P. Wks., Geo. J. Goetz, comr., City Hall, Zone 2, reconstr. Ohio St. Bridge. $5,000,000. Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y., consult. engrs. CD 6/26.

STREETS AND ROADS

▲ **D. C., Wash.**—D. C. Govt., Dpt. Hys., 499 Pa. Ave., N.W., repaving, widening N. Capitol St. Louisiana to Michigan Aves. $1,900,000. CD 8/29.

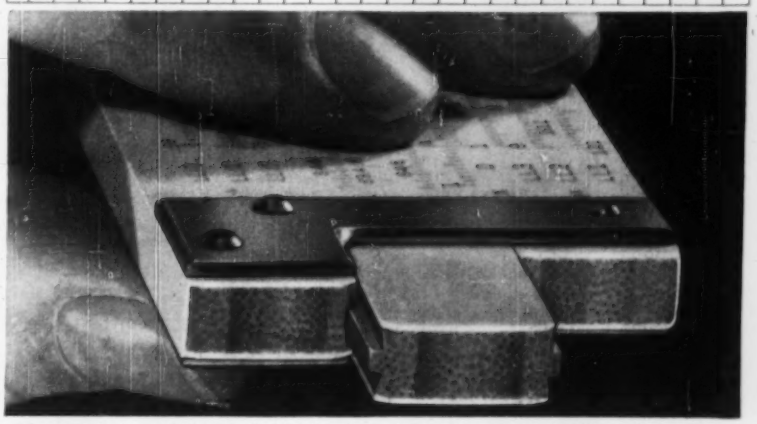
▲ **NEW YORK**—State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany,
Nassau Co.—Wantagh-Oyster Bay Expressway extending from Wantagh Causeway, south of Merrick Rd. in Wantagh and passes through Seaford, Wantagh, Plainedge, Bethpage, Plainview, Woodbury, Syosset and Oyster Bay to northerly terminus near South St. in Oyster Bay, approx. 17 miles. $12,000,000.

▲ **WASHINGTON**—State Hy. Comn., Olympia,
Pierce Co.—constr. Snoqualmie cutoff from Tacoma through Auburn to U. S. Hy. 10. $4,583,000. Work to start next year. W. A. Bugge, state hy. dir. CD 12/13/56.

EARTHWORK, WATERWAYS

▲ **OHIO**—Ohio Dpt. Natural Resources, State Dpt. Bldgs., Columbus, Seneca County Lake, 300 acres 1.5 mi.

DRAFTING TRENDS



Magnified view of the laminated bamboo construction used in Post slide rules.

Why the trend to bamboo construction?

Due to its unique characteristics, bamboo is an especially suitable base material for various unusual applications. For example, experience over many years has proven bamboo's properties are ideal for slide rule construction. Here are some of the most outstanding reasons why the growing trend is to bamboo rules:

Bamboo gives smoother operation

Slide rules of other materials often require use of lubricants to insure smooth sliding. Bamboo avoids messy additives because it has natural, sealed-in silica particles that provide *self-lubrication*. The longer you use a bamboo rule, the easier it is to operate.

Bamboo holds its dimensions, retains its accuracy

Even in hot, humid weather, laminated bamboo slide rules resist expansion better than any other material. This dimensional stability assures consistently accurate readings.

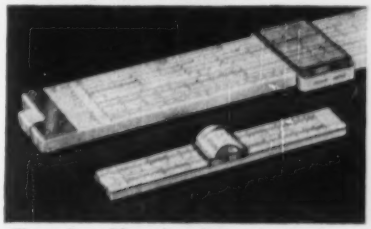
Recognizing the advantage of bamboo, Post uses it exclusively for slide rule construction. To the basic advantages of bamboo, Post has added several other features that further improve slide rule accuracy and dependability. For example, graduations are "engine-divided." Every marking is cut into the snow white celluloid face with a machine controlled knife edge. "Engine-divided" scales are easy to read, unfailingly accurate and last the lifetime of the rule.

Even the metal bound cursor on Post slide rules is designed for accuracy. A tiny, hidden spring keeps a perfectly vertical hairline.

Recent slide rule advancement

The latest development in bamboo slide rules was the introduction of Post's Versalog rule five years ago. This precision instrument meets the exacting demands of modern research, engineering and design. It features greater accuracy (four times greater in square root determination), color coding of trigonometric scales, new end zone designations for faster and surer computations, and more convenient arrangement of LL scales.

Probably the handiest bamboo slide rules made are Post's Vest Pocket rules. One has a 5" scale, the other a 4" scale with a magnifier as standard equipment. They are perfect for fast, spur-of-the-moment calculations.



(Top) *Post Versalog slide rule* (Bottom) *Post 1441 Vest Pocket slide rule*

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northeast of Tiffin for recreational purposes, Seneca Co., $400,000; 680 acre water supply for Minerva and recreational lake, 3¼ mi. north of Minerva, Stark Co. $750,000; 680 acre water supply and recreational lake north of Minford, Scioto Co., $750,000. CD 11/3/44.

AIRPORTS

▲ **Ill., Chicago**—AIRPORT—City, City Hall, plans by Naess & Murphy, 80 E. Jackson Blvd., O'Hare International Airport expansion, Bryn Mawr Ave. and Wolf Rd., Park Ridge, $75,000,000.

▲ **Pa., Phila**—AIRPORT IMPRVS.—City, Dpt. Procurement, City Hall Annex, new terminal bldg. at North Phila. Airport, $1,750,000; fixed base operations hangars, $1,150,000; Exten. Runways 15-33, $390,000; Exten. Runways 6-24, $300,000; Exten. T Hangars, $130,000. CD 3/9/56.

▲ **Pa., Phila.**—AIRPORT IMPRVS.—Dpt. Procurement, City Hall Annex, hangar constr., $2,000,000, Constr. 1958; hangar constr. Planning Line No. 5, $2,000,000, Constr. 1959; terminal area constr., $1,700,000, Constr. 1959-1962; taxiway to hangar area, $300,000; new air freight area, $1,000,000, at Phila. International Airport. CD 3/9/56.

PUBLIC BUILDINGS

▲ **Calif., Arcata**—SCHOOLS—Arcata Union High School Dist., 1720 M St., Arcata, defeated bonds Nov. 26, schools. $1,200,000. CD 11/18.

▲ **Calif., Los Angeles**—SCHOOLS—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Albert C. Martin & Assoc., consult engrs.-archts., 331 Beaudry St., Granada Hills High School, Zelzan at San Jose Sts., Granada Hills. $4,000,000. CD 4/8/55.

▲ **Calif., Los Angeles**—SCHOOLS—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Paul R. Williams, 3757 Wilshire Blvd., Marina Del Rey Junior High School; admin. bldg., classrooms, shops, multi-purpose bldg., library, etc., West Los Angeles, $2,380,000; plans by Roy W. Donley, 8320 Melrose Ave., constr. Superior St. School, Chatsworth, $480,000. CD 4/8/55.

▲ **Calif., Los Angeles**—STUDENT UNION—University of California at Los Angeles, 404 Hilgaard Ave., Los Angeles, plans by Welton Becket & Assoc., 5657 Wilshire Blvd., 5 story, rein.-con., steel frame student union bldg., at U.C.L.A. $5,000,000.

▲ **Calif., Orange**—SCHOOL—City Unified School Dist., Orange, $1,250,000 bond election Feb. 11, high school; $1,250,000 bond election Feb. 11 elementary school.

▲ **Colo., Boulder**—SCHOOLS, etc.—School Dist. No. 3, 1440 Walnut St., voted $2,500,000, bonds Nov. 26, Junior High School, Elementary School and addns. to 5 other schools. CD 10/25.

▲ **Colo., Denver**—HOSPITAL—Beth Israel Hospital, W. 16th Ave. and Lowell Blvd., plans by Fisher, Fisher & Davis, consult. engrs.-archts., 827 Denver National Bldg., hospital addn. $1,200,000.

▲ **Colo., Littleton**—SCHOOLS—Bd. Educ., Littleton, voted bonds Nov. 25, constructing schools and addns. $4,615,000. CD 11/8.

▲ **Conn., Bristol**—SCHOOL—Town, Town Hall, plans by Harold A. Hayden, 175 Main St., high school. $3,000,000. Lyons & Mather, 211 State St., Bridgeport, assoc. archts. John P. Legnos, 30 Gillett St., Hartford, consult. engr. CD 11/4.

▲ **Conn., New Britain**—SCHOOL—Town Bd. Educ., 27 Hillside Pl., plans by Hollis W. Kincaid, 993 Farmington Ave., West Hartford, Western Elementary School, Slater Rd. $1,060,000. CD 4/24/56.

▲ **Conn., Stamford**—SCHOOL—Town, Town Hall, plans by Ralph Eberlin, 123 E. 77th St., New York, N. Y., high school, Newfield Ave., North Stamford, $2,500,000. Urbahn, Brayton & Burrows, 654 Madison Ave., New York, N. Y., consult. engrs. CD 10/25.

▲ **Conn., Wolcott**—SCHOOL—Town of Wolcott, Town Hall, plans by Lyons & Mather, 211 State St., Bridgeport, high school, Boundline Rd. $1,000,000. Walter T. Smith, 117 E. State St., Westport, consult. engrs. Howard W. Harper, 1429 Mill Hill Rd., Southport, engr. CD 4/26.

▲ **Del., St. Georges**—SCHOOL—Gunning Bedford School Dist., St. Georges, voted bonds Junior-Senior High School. $2,950,000.

▲† **D. C., Wash.**—HOSPITAL—General Services Admin., 19th and F Sts. N. W., plans by Ronald S. Senseman, 7705 Georgia Ave. N. W., Geriatics Hospital, treatment and cafeteria bldg., St. Elizabeths Hospital, Congress Heights, $3,549,000.

▲ **La., Grambling**—DORMITORIES—Grambling College, c/o Ralph L. Jones, Grambling, 2 dormitory units for boys, $642,000; 2 dormitory units for girls, $650,000.

▲ **Mass., Framingham**—SCHOOLS—Town, c/o Supt. Schools, Lexington St., plans by M. A. Dyer Co., 24 School St., Boston, Mass., Junior-Senior High School, Winch Park, Approx. $2,000,000. CD 3/29.

▲ **Mich., Caro**—HOSPITAL—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, hospital, at Caro State Hospital. $1,250,000.

▲ **Mich., Livonia**—SCHOOLS—City, Benton Yates, supt. Schools, Livonia, defeated bonds Nov. 25, school program, incl. Junior High, 2 Junior High School addns., new high school and 10 elementary schools, $12,000,000. CD 11/8.

▲ **Mich., Parchment**—SCHOOLS—City, Bd. Educ., Parchment, voted $1,496,000 bonds Nov. 25, Junior-Senior High School and elementary school. CD 11/14.

▲ **Minn., Minneapolis**—SECURITY—State, Dpt. Admin., P. T. Peterson, dir. Procurement, 19 State Capitol, St. Paul, plans by Thorshov & Cerny, 400 Metropolitan Bldg., employment security bldg., Third St. and Second Ave. South. $1,500,000.

▲ **Minn., St. Louis Park**—SCHOOL—Bd. Educ., H. Enestvedt, supt. Schools, St. Louis Park, voted $2,325,000 bonds Nov. 26, Junior High School, Texas Ave. and 22 St.

▲ **Mo., St. Louis**—SCHOOL—Bd. Educ., George H. Fletcher, comr. School Bldgs., 911 Locust St., Zone 1, Vaughn Elementary School, Hogan and O'Fallon Sts. $1,500,000. Bids late January or February. CD 5/31/55.

▲† **Neb., Lincoln**—HOUSING—Procurement Office, Lincoln Air Force Base, Lincoln, plans by Clark & Enersen 1415 Sharp Bldg., 600-unit housing, Lincoln Air Force Base. $8,000,000. Bids about Jan. 15. CD 8/24/56.

▲ **Neb., Lincoln**—SCHOOL—Bd. Educ., 720 S. 22 St., Junior High School, 68th and Walker Sts. $1,250,000. CD 2/15/55.

▲ **N. J., Eatontown**—SCHOOL—Eatontown-Shrewsbury Regional High School Dist., Eatontown, high school, $1,270,000-$2,500,000.

▲ **N. J., Harrison**—SCHOOL—Town of Harrison, 318 Harrison Ave., high school. $2,000,000.

▲ **N. Y., Jericho**—SCHOOL—Bd. Educ., Jericho, Junior-Senior High School addn. to Cedar Swamp Rd. School. $3,600,000.

▲ **N. Y., Uniondale**—SCHOOLS—Bd. Educ., High School, plans by Frederick P. Wiedersum Assocs., 65 Roosevelt Ave., Valley Stream, N. Y. two 800-student Junior High Schools at Milburn Ave., Hempstead and Jerusalem Ave., $4,400,000. Referendum vote on Dec. 14.

▲ **O., Celina**—POWER PLANT—City, R. W. Barkley, mgr., City Hall, municipal power plant. $1,250,000. Constr. Fall 1958.

▲ **Pa., Montrose**—SCHOOL—Montrose Consolidated Jr. School Dist., Montrose, secondary school bldg. $1,686,460.

▲ **Pa., Newmanstown**—SCHOOL—Eastern Lebanon County Joint School Dist., Newmanstown, secondary School bldg. $2,700,000.

▲ **Pa., Phila.**—SCHOOL—Bd. Educ., 21st and Winter Sts., plans by Savery Scheetz & Gilmour, 1500 Walnut St., elementary school, 49th and Parris Sts., $1,300,000; plans by Nolen & Swinburne, 226 S. 16th St., Phila., elementary school, Sergeant and Jasper Sts., $575,000. CD 10/22/51.

▲ **Pa., Phila.**—HOSPITAL—City, Dpt. Procurement, City Hall Annex, laundry at Phila. General Hospital, 34 St. and Curie Ave., Planning No. 53, $1,020,200. Scheduled for constr. in 1962.

▲ **Pa., Phila.**—REGIONAL LIBRARY—Dpt. Procurement, City Hall Annex, regional library, Grant and Burtleton Aves. $1,005,000; regional library, 52 and Market Sts. $1,005,000; branch library, Ridge and Leverington Aves. $350,000.

▲ **Pa., Pittsburgh**—COUNTY OFFICE—Allegheny Co., Dpt. Properties & Supplies, Pittsburgh, 10 story county office bldg. addn. and remodeling existing 6 story county office bldg. $8,651,000. Constr. 1959.

▲ **Tenn., Knoxville**—AUDITORIUM-COLISEUM—City, City Hall, voted bonds Nov. 21, auditorium-coliseum. $3,000,000. CD 10/14.

▲ **Tenn., Memphis**—EXPOSITION—City, City Hall, (Mid-South Fair Inc.,) exposition bldg. $1,250,000.

▲ **Tex., San Antonio**—SCHOOLS—San Antonio Independent School Dist., Lavaca and Matagorda Sts., plans by Phelps & DeWees & Simmons, 342 W. Woodlawn St., Junior High School, "Sam Houston High School," (formerly No. 7 Elementary School) near Coliseum $1,250,000; new elementary school, "Pershing Elementary School" 1301 Van Ness St., (formerly listed as No. 8 under Elementary Schools) $500,000. CD 5/25/55.

▲ **Wash., Renton**—SCHOOL—School Bd., Renton, plans by Mallis & DeHart, Lyon Bldg., Seattle, Zone 4, Junior High School. $1,127,819.

▲† **Wash., Spokane**—HOUSING—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, plans by Bassetti & Morse, Tower Bldg., Seattle, Zone 1 and McClure & Adkison, Sherwood Bldg., Seattle, 250 houses for Air Force families near Fairchild Air Force Base, under Capehart Housing Act. $5,000,000. CD 1/22.

▲ **Wash., Tacoma**—SCHOOL—Franklin Pierce School Dist. 402, S. 112 and Portland St., plans by Lea, Pearson & Richards, 240 S. Stadium Way, Junior High School. $1,000,000. bids to be called early next year. CD 5/31.

▲ **Ont., Chatham**—HOSPITAL—Ontario Dpt. P. Wks., Parliament Bldgs., Toronto, hospital, on 375 acre site on shore of Lake Erie, 15 mi. west of here. $8,000,000. CD 12/4/49.

▲ **Que., St. Tite**—OLD PEOPLES' HOME—Provincial Govt., Quebec City, plans by Robert A. Johansen, 205-120 St., Shawinigan South, Old Peoples' Home, $1,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Baron**—SHOPPING CENTER—Bldg; Hal Hayes Contracting Inc., 13006 Saticoy St., Hollywood, 200,000 sq. ft. shopping center, consisting of supermarket, drugstore, variety store, dpt. store, furniture store, bank, post office, etc., next to Desert Lake Motel. $2,000,000.

▲ **Calif., Garden Grove**—SHOPPING CENTER—H. Shanedling Sons Corp., 6595 Wilshire Blvd., Los Angeles; Minneapolis Branch, 2025 Nicollet Ave., Minneapolis, Minn., H. M. Garber, genl. mgr., plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Minn., constr. 40 store shopping center near Disneyland. $5,000,000. Constr. in 3 months.

▲ **Calif., National City**—HOSPITAL—Paradise Valley Sanitarium & Hospital, 2575 East 8 St., plans by Jay Dewey Harnish, Ontario, 4 story hospital addn. $3,000,000-$4,000,000. Constr. 1958. CD 11/13.

▲ **Colo., Denver**—COLLEGE OF LAW—University of Denver, University Park Campus, College of Law Bldg., $1,235,000. CD 12/5/48.

▲ **Conn., Clinton**—HOUSES—Clinton Development Corp., Commerce St., 50 houses, Commerce St. $1,250,000.

▲ **D. C., Wash.**—HEADQUARTERS—American Association of University Women, 1634 Eye St. N. W., plans by Corning & Moore, 1302-18th St. N. W., Headquarters Bldg., Virginia Ave. and 24th St. N. W. $2,000,000. CD 11/25.

▲ **D. C., Wash.**—OFFICE—Brookings Institutions, 722 Jackson Pl. N. W., plans by Faulkner, Kingsbury & Stenhouse, Ring Bldg., 8 story office bldg. in 1700 block of Massachusetts Ave. N. W., $2,000,000.

▲ **Iowa, Grinnell**—FINE ARTS CENTER, etc.—Grinnell College, c/o business mgr., Grinnell, plans by Skidmore Owings & Merrill, 100 W. Monroe St., Chicago, Ill., Fine Arts Center. $1,100,000. CD 11/8.

▲ **Kan., Abilene**—LIBRARY—Eisenhower Library Comm., c/o Gov. George Docking, State Capitol, Topeka, library to house papers of President Eisenhower also to serve as seminar and study center. $3,000,000. Constr. 1958.

▲ **Kan., Wichita**—SHOPPING CENTER—William Levitt & Assocs., 323 W. Murdock St., plans by Sidney Morris & Assocs., 134 N. LaSalle St., Chicago, Ill., Wastwood Shopping Center, Kellogg St. and Rock Rd., $2,500,000. CD 11/20.

▲ **Mass., Boston**—GRADUATE CENTER—Northeastern University, 360 Huntington Ave., graduate center, Huntington Ave. Campus. $1,000,000. Constr. 1958.

▲ **Mich., Southfield**—CHURCH—Armenian Apostolic Church, Fr. Arnak Kasparian, pastor, E. Mardigian, chn. Bldg. Comn., 1335 Oakman Blvd., Detroit, plans by Soren Pilafian, 457 West Fort St., Detroit, church, Northwestern Hy. $1,000,000.

▲ **Mo., Ladue** (St. Louis 24 P.O.)—HOSPITAL—Missouri Baptist Hospital, J. S. Pillsbury, Bd. pres., 919 Taylor Ave., Zone 8, St. Louis, plans by Edward H. Noakes, 1145 19th St. N.W., Wash., D. C., 1st phase 150-bed (10 story eventually 500-bed) center hospital on 16-acre tract at Lindbergh Blvd. and Litzsinger Rd. $4,000,000-$12,000,000. CD 12/3.

▲ **N. J., Bloomfield**—OFFICE—Schering Corp., 60 Orange St., plans by Krahmer, Staab & Immen, 21 Forest Ave., Glen Ridge, office bldg. addns. $1,000,000. CD 3/27/56.

▲ **O., Cleveland**—HOSPITAL—Jewish Convalescent Hospital, 18704 Harvard Rd., Zone 22, plans by Hays & Ruth, 1730 Euclid Ave., Cleveland, 15, O., convalescent hospital, site has been changed from E. 105th to present location. $1,100,000. CD 4/16/56.

▲ **O., Fairview Park**—GARDEN APARTMENT—Franklin Bros. Realty Co., 4750 Lorain Ave., Cleveland, Zone 2, Garden-Type Apartment, between Center Ridge and Addington Rds., west of 212 St. $2,500,000.

▲ **O., Mayfield Heights**—HOSPITAL—Hillcrest Hospital, c/o Dr. Richard Renner, Doctor's Hospital, 12345 Cedar Rd., Cleveland, Zone 6, plans by Travis G. Walsh, 2123 E. 9th St., Cleveland, Zone 15, (1st unit) Hospital. $2,000,000.

▲ **O., Pepper Pike**—HOUSING—Keyes-Treuhaft Co., 10514 Shaker Blvd., Cleveland, Zone 4, plans by Maxwell Norcross, 13125 Shaker Square, Cleveland, George Burroughs, Cleveland, and John Little, 4900 Euclid Ave., Cleveland, 60 homes, expansion to Landerwood Development, Over $2,000,000.

▲ **Tex., Dallas**—DWELLINGS—Fred W. Bell, Builder, 6616 Forest Park, Dallas, 6 all-masonry dwellings $350,000; 9 all masonry type dwellings $365,150; 11 all masonry dwellings, $378,250, in "Northwood Terrace".

▲ **Tex., Dallas**—HOSPITAL—Children's Medical Center, c/o Angus Wynne Jr., 401 Wynnewood Village, Dallas, plans by James Hamilton, Associates, hospital consultants, 425 S.E. Harvard St., Minneapolis, Minn. 175-bed hospital near Parkland Memorial Hospital. $3,125,000.

▲ **Tex., Farmers Branch**—DWELLINGS—Raymond Nasher, c/o Republic National Bank Bldg., Dallas, 28 dwellings, $366,190; 31 dwellings, $358,500; 36 dwellings, $360,000; 34 dwellings, $376,175; 26 dwellings, $347,500; 30 dwellings, $355,100, in Johnson Park.

▲ **Tex., Farmers Branch**—DWELLINGS—Raymond Nasher, Republic National Bank Bldg., Dallas, 35 dwellings, $375,000; 27 dwellings, $361,225; 24 dwellings, $349,450; 30 dwellings, $373,625; 33 dwellings, $367,500; 25 dwellings, $354,775, area Valley View Rd. and Marsh Lane.

▲ **Tex., Houston**—CHURCH—Bellaire Baptist Church, 461-Bellaire Blvd., church plant addns. $1,750,000.

▲ **Tex., Houston**—OFFICE—Fish Eng. Corp., c/o M&M Bldg., 5 story, bsmnt. 200,000 sq. ft., office (fdn. for 3 addnl. floors later). $2,250,000. Bids June 58. CD 11/22.

▲ **Tex., Longview**—YMCA BLDG.—Young Mens Christian Assn., Longview, plans by Wilson, Morris, Crain &

Anderson, 3330 Graustark St., Houston, and Box 2146, 216½ E. Tyler St., Longview, YMCA bldg. $1,000,000.

▲ Tex., San Antonio—DWELLINGS—Aaron Mandel, Builder, 722 S. Zaramora St., 41 low-priced dwellings, $385,000; 41 low-priced dwellings, $391,500; 37 low-priced dwellings $368,125; 34 low-priced dwellings, $348,175; 200-acre tract Pres Heights Subdivision.

▲ Wash., East Bremerton—HOSPITAL—Harrison Memorial Hospital, Bremerton, 150 bed hospital, $2,000,000, Constr. 1963.

▲ Wash., Seattle—OFFICE—United Exchange Bldg., Corp., Exchange Bldg., Zone 4, plans by Skidmore, Owings & Merrill, 1 Montgomery St., San Francisco, Calif., and Bindon & Wright, Hoge Bldg., Zone 4, 2 story office bldg. air-conditioned, south of Exchange Bldg. $11,000,000. Work to start this year.

▲ Ont., Peterborough—HOME FOR AGED—City of Peterborough, City Hall, plans by Craig & Zeidler, 147 Hunter St. W., 3 story, 180-bed Home for Aged with provision for 40 addnl. beds, central administration center, with 3 wings for normal care, bed care and special care residents, dining room, auditorium, lounge, shops, normal care section to be 3 story, rest of bldg. 1 story, $1,216,000.

▲ Que., Montreal—APARTMENT—Colger Ltd., 4560 Decarie Blvd., plans by Mayerovitch & Bernstein, 1500 St. Catherine St. W., 15½ story, penthouse and 2 bsmnts., apartment, 180-unit, St. Luke St. $2,000,000.

▲ Que., Montreal—HOUSING—International Construction, Inc., 1010 St. Catherine St. W., brick walls housing concrete fdn. L'Abord a Plouffe, (Montreal Suburb). $1,600,000. Constr. in Spring.

INDUSTRIAL BUILDINGS

▲ Calif., Sunnyvale—PLANT—Day-Brite Lighting, Inc. of California, 530 Martin Ave., Santa Clara, mfg. plant, 15-acre site. $1,000,000.

▲ Conn., Bloomfield—RESEARCH CENTER—Royal-McBee Corp., Westchester Ave., Port Chester, N. Y., plans by Eliot F. Noyes & Assocs., 105 Main St., New Canaan, 2 story, 90,00 sq. ft., campus type concrete frame research center, Marple Ave. $2,000,000. Werner, Jensen & Korst, 641 Summer St., Stamford, consult. engrs. Fred S. Dubin Assocs., 178 S. Whitney St., Hartford, mech. engrs. CD 9/3.

▲ Conn., Bridgeport—MANUFACTURING—General Electric Co., Boston Ave., manufacturing bldg. imprvs. and modernization for mfg. electric fans, Boston Ave. $2,000,000.

▲ Ill., Chicago—PRINTING PLANT—Regensteiner Corp., 310 S. Racine Ave., plans by Friedman, Alschuler & Sincere, 223 W. Jackson Blvd., 2 story, 190,000 sq. ft., brick printing plant, 5400 N. Elston Ave. $2,500,000.

▲ N. Y., Rouses Point—PLANT—Quebec Lithium Corp., 507 Place D' Armes, Montreal, Que., refining plant, on 450-acre tract. $3,000,000.

▲ Tex., Alice—PLANT—Sun Oil Co., c/o M. Esperson Bldg., Houston, gas injection plant in Seeligson Field, near here. $1,750,000.

▲ Tex., Houston—PLANT—The Ladish Co., Cudahy, Wis., and c/o Prudential Bldg., Houston, plant addn. on 50 acre tract Katy-Lumpkin Industrial Dist. $2,000,000.

▲ Tex., Houston—INDUSTRIAL—Texas Instruments Inc., 6000 Lemmon St., Dallas, will not construct doubling capacity by 300,000 sq. ft. masonry constr. existing (recently built) industrial bldg. (mfg. germanium transistors and imprv. silicon transistors) $2,500,000. (correction—no such proj.): CD 11/8.

▲ Alaska, Nenana—GENERATING PLANT—Golden Valley Electric Assn., Fairbanks, coal-fired steam power generating plant. $6,000,000. North Pacific Consultants Inc., Park Bldg., Portland, Ore., and G. E. Wieland, Arcade Bldg., Seattle, Wash., consult. engrs.

▲ Ont., Guelph—FACTORY—Imperial Tobacco Co., Ltd., 3810 St. Antoine St., Montreal, Que., plans by McDonnell & Lenz, 42 James St. N., Hamilton, 250,000 sq. ft. steel-framed bldg. to serve as cigarette factory. $1,000,000. R. P. Allsop & Assocs., Ltd., 290 Davenport Rd., Toronto, consult. engrs.

▲ Sask., Regina—PLANT—Consumers' Co-operative Refineries Ltd., Regina, plant addn., new unit will manufacture petroleum coke. $1,300,000.

UNCLASSIFIED

▲ Ill., Chicago—MAUSOLEUM—Oak Woods Cemetery, 1035 E. 67th St., plans by Harley Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., mausoleum. $5,000,000.

▲ Montana and North Dakota—GAS PIPE LINE, etc.—Montana-Dakota Utilities Co., 831 2 Ave., South Minneapolis, Minn., natural gas line 1,980 hp. compressor at Dickinson, N. D. 6.1 mi. 12¾ in. transmission line from Mandan to Bismarck, N. D., regulation stations at both places, 4,640 ft. 8⅝ in. line near Sidney, Mont., etc. $1,095,000. Approved by Federal Power Comn. CD 8/13/54.

▲ Oklahoma—GAS LINE—Mooki Gas Corp., 1341 South Boston St., Tulsa, 169 mi. 16 in. high pressure gas line from Seminole Fields to Missouri state line near Jay, Delaware Co., $12,571,757. V. J. Hermal, 1341 South Boston Ave., Tulsa, engr.

▲ Wash., Olympia—OVERHEAD PARKING DECK—City, City Hall, rein.-con. overhead parking deck. $4,000,000.

(Proposal Advertisement see pp. 77 and 78)

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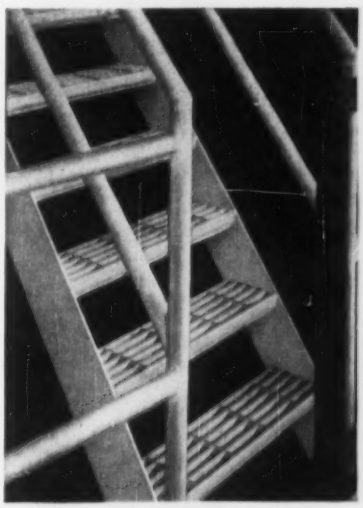

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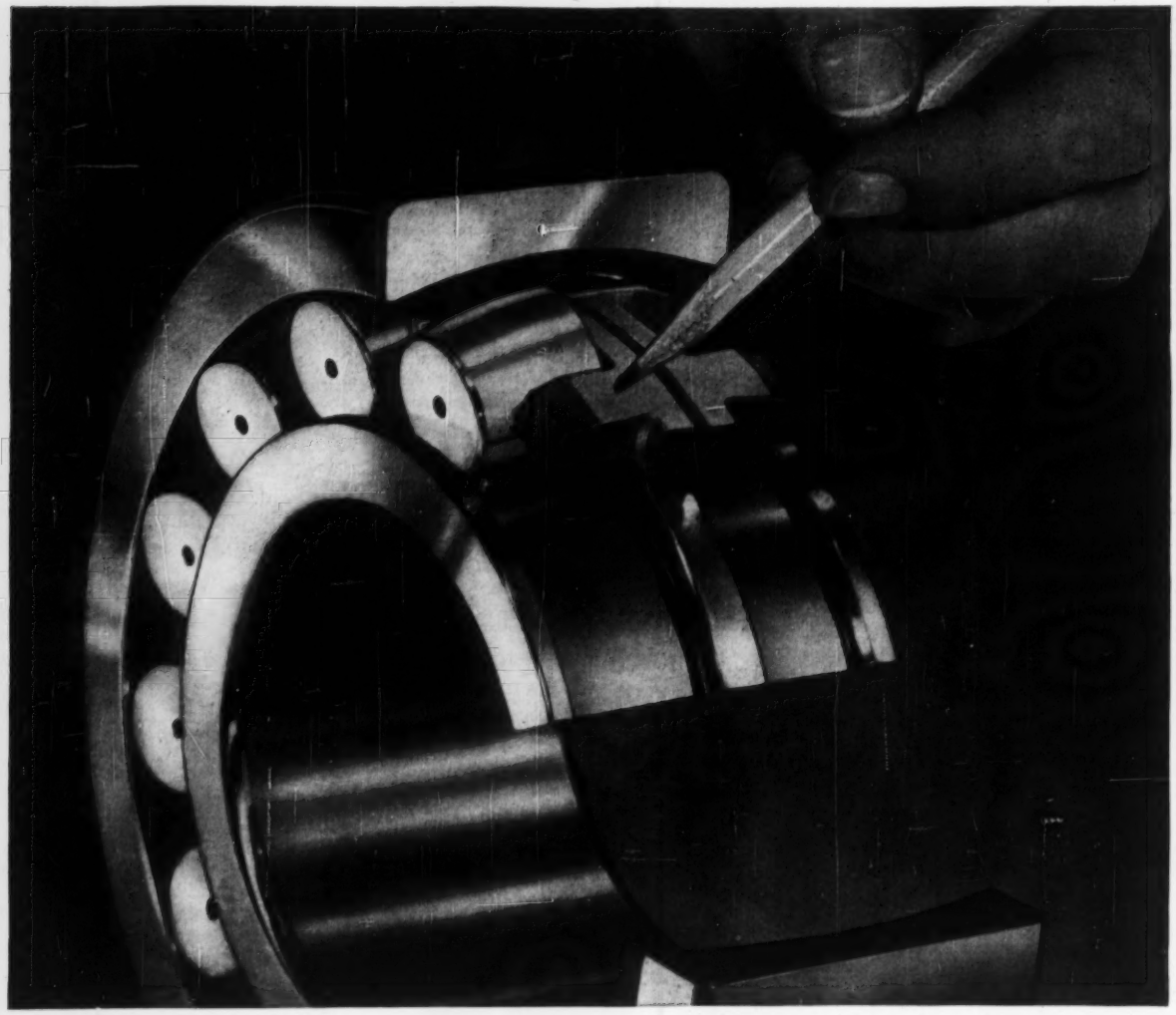
TORRINGTON *SPHERICAL ROLLER* BEARINGS



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These fully machined cast-bronze, land-riding cages—one for each path of rollers—are important performance builders in TORRINGTON'S Spherical Roller Bearings. The one-piece retainers keep the rollers perfectly aligned at all times, even under conditions of shock load and sustained speeds. Lubrication is more effective, too, as the lubricant has easy access to vital points of contact between rollers and races.

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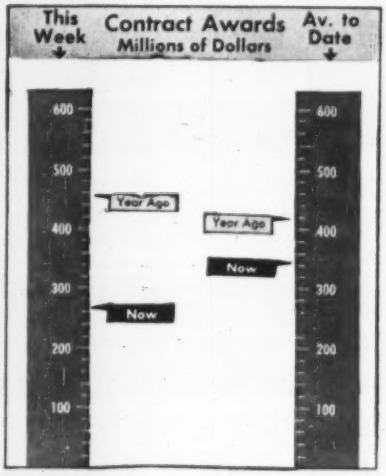
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 51 wks 1957	Chge '56-'57 %
	millions		
Federal	$22.6	$2,168.5	+30
State and Municipal	145.7	7,280.2	+13
Total Public	168.3	9,448.7	+17
Total Private	97.3	8,263.3	−38
U. S. Total	$265.6	$17,712.0	−17
By Type of Work			
Waterworks	$3.4	$357.0	+1
Sewerage	8.4	536.0	−6
Bridges	10.2	774.8	+25
Highways	76.9	2,916.2	+21
Earthwork, Waterways	11.6	960.6	+34
Buildings:			
Public, Excl. Housg.	44.3	2,325.8	+13
Public Housing	9.2	624.2	+97
Private Housing	36.2	3,007.5	−43
Commercial	29.5	1,723.3	−15
Industrial	29.9	3,025.3	−42
Unclassified	6.0	1,461.3	−20
U. S. Total	$265.6	$17,712.0	−17

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

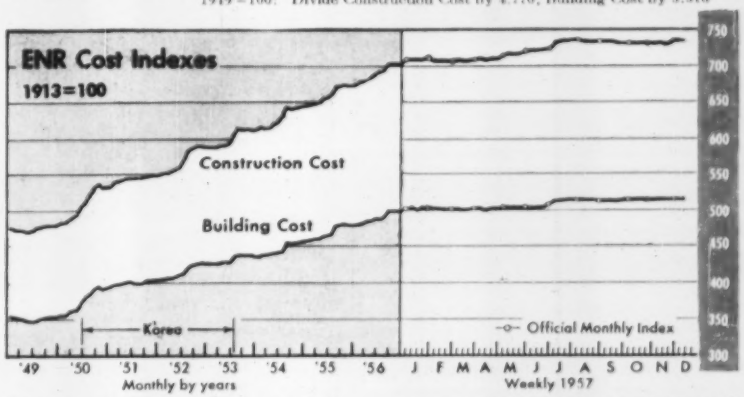
NEW CAPITAL FOR CONSTRUCTION

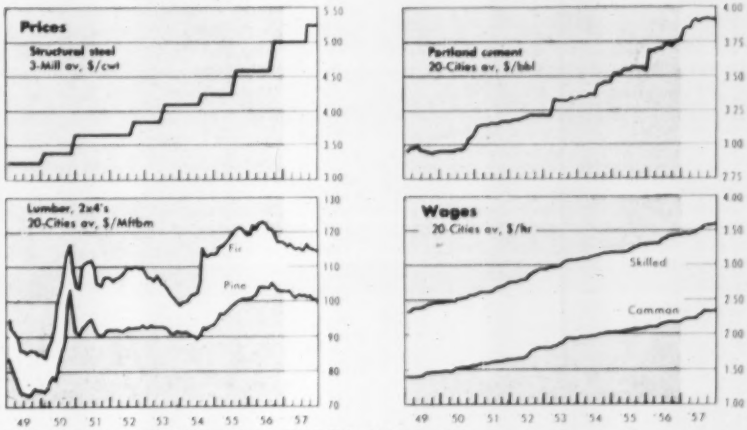
	Week of Dec. 12	Cum. 50 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$59.6	$5,650.6	+24
State and Municipal:			
All Except Housing	63.8	5,415.9	+23
Housing	24.0	179.8	+97
Federal Loans	3.0	189.4	+25
Federal Aid	...	2,161.2	+102
Total Nonfederal	$150.4	$13,596.9	+32
Federal Appropriations:			
In U. S.	...	$2,777.0	−20
Outside U. S.	...	29.0	+82
Total New Capital	$150.4	$16,442.3	+19

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Dec. 12 1957	% Change from Nov. 14 1957	% Change from Dec. 13 1956
Construction Cost	737.44	+0.1	+4.6
Building Cost	516.96	−0.2	+3.5

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518





ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Dec. 1957	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Dec. 1957	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	548	0	+5.1	456	0	+3.4
Baltimore	670	0	+11.3	520	0	+4.4
Birmingham	593	+5.3	+7.1	499	+6.3	+9.6
Boston	765	−0.7	+2.4	523	−1.0	+2.6
Chicago	836	−0.1	+5.8	528	−0.1	+4.4
Cincinnati	748	0	+4.6	504	0	+2.6
Cleveland	859	−0.3	+4.8	524	−0.4	+3.2
Dallas	547	0	+2.3	451	0	+0.5
Denver	710	0	+2.9	522	0	+0.5
Detroit	831	0	+2.8	545	0	+3.4
Kansas City	742	0	+3.9	516	0	+2.6
Los Angeles	778	0	+6.4	513	0	+3.9
Minneapolis	788	0	+4.1	537	0	+2.2
New Orleans	591	0	+4.7	481	+0.2	+3.6
New York	888	0	+5.4	591	0	+3.9
Philadelphia	775	0	+3.7	561	0	+2.3
Pittsburgh	788	0	+8.4	568	0	+6.6
St. Louis	796	0	+5.0	546	0	+3.9
San Francisco	761	−0.3	+5.5	506	−0.4	+4.7
Seattle	747	−1.2	+3.5	458	−1.9	+2.0
U. S.—20 Cities' average	738	+0.1	+4.9	517	+0.1	+3.5
Montreal	591	0	+5.3	453	0	+3.4
Toronto	609	0	+2.3	471	0	+2.5

Decline Continues in Plant, Equipment

The slide in business expenditures for plant expansion—which began about mid-year—is growing, according to the latest government survey of business intentions.

The new look at business investment programs shows this in a joint Security and Exchange Commission-Commerce Department survey. It reports business plans to purchase new plant and equipment through the first quarter of 1958, based on questionnaires filled out in October and November.

From the current quarter to the first quarter of 1958, a 5% drop is indicated—from a seasonally adjusted annual rate of $37.47 billion to $35.52 billion.

The first SEC-Commerce look at 1958 as a whole will come three months from now. The McGraw-Hill Survey of Investment Intentions for 1958 indicated a 7% drop under this year (ENR Nov. 14, p. 143).

The boom in plant and equipment expenditures reached a peak of $37.75 billion (annual rate, seasonally adjusted) in the third quarter of this year, as measured in the SEC-Commerce series. This was some $400 million higher than expected, apparently because more plentiful supplies of steel and other materials speeded up projects already under way. The expectation for the current quarter is for a drop of less than 1% from July-September, compared

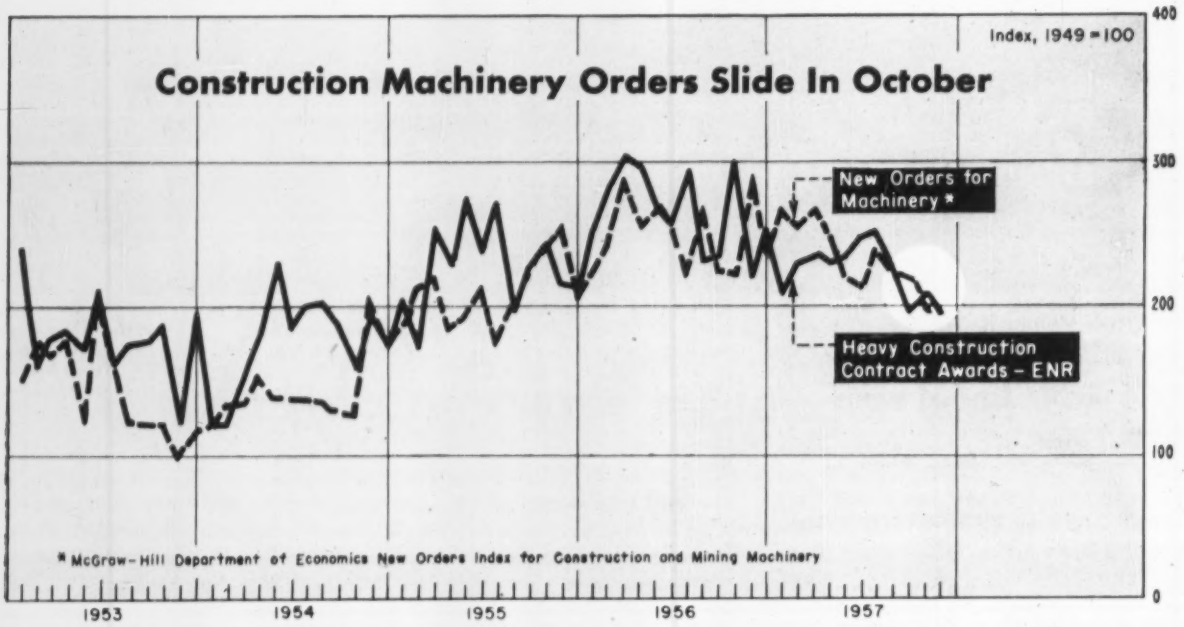
Expenditures for New Plant and Equipment by U. S. Business[1]

Quarterly, 1956-58, seasonally adjusted at annual rates

(Billions of dollars)

	1956 4th qtr	1957 4th qtr	1958 1st qtr
Manufacturing	**15.81**	**16.16**	**14.96**
Durable Goods Industries	8.21	7.93	7.27
Non-Durable Goods Industries	7.60	8.23	7.69
Mining	**1.28**	**1.20**	**1.16**
Railroad	**1.23**	**1.22**	**1.16**
Transportation Other Than Rail	**1.76**	**2.03**	**1.82**
Public Utilities	**5.27**	**6.62**	**6.48**
Commercial and other[2]	**11.11**	**10.24**	**9.94**
Total	***36.46***	***37.47***	***35.52***

[1] Data excludes expenditures of agricultural business and outlays charged to current account.
[2] Includes trade, service, finance, communication and construction.



New Orders Index Now Lowest Since July, 1955

New orders for construction machinery dropped in October to the lowest level since July, 1955. The McGraw-Hill Department of Economics reports that the New Orders Index for October was 197 (1949 = 100).

October was the third consecutive month in which contractors trimmed their orders for new machines. The downturn follows closely the trend in heavy construction contracts. Based on ENR figures, the contract awards index fell from a 1957 high of 253 in July to 199 in September. New orders, however, showed a decline on the index from 241 in July to 197 in October.

Expenditures

with the 5% dip indicated for January-March of next year.

On an unadjusted basis, the first quarter of each year is low due partly to winter weather, but comparisons of intentions for January-March 1958 with the first quarter of this year show which industry groups are still expanding, and which are leading the downturn.

Running ahead of the first quarter this year by substantial margins are the chemical, petroleum, non-rail transportation, public utilities, non-electrical machinery, iron and steel, and nonferrous metals groups.

The largest decline is indicated for motor vehicles and equipment. The industry expects to spend $104 million less in the first quarter than it did in the same period this year, a drop of more than one-third. Railroads and the big "communication, commercial and other" categories show drops of about 10%.

Slow But More Sure

Seattle studies six-year schedule for referendums

The wholesale rejection at past elections of great numbers of public works and bond issue proposals by Seattle voters has resulted in a new plan that may see close to $100 million in civic improvements placed before the electorate during the next six years.

According to Mayor Gordon S. Clinton, some past elections have seen great numbers of proposals placed on the ballots for approval or disapproval. Because of the number to be acted upon, Mayor Clinton said that the voters have been confused and therefore rejected all of the balloted measures.

Now under consideration by the mayor and the City Council is a program that would have all proposals "thoroughly studied and their relative importance weighed, so that an order of priority can be worked out," the mayor explained.

He said that projects or bond issues placed on the ballot in this manner would "go before the people as having been presented by their city government—not individual departments or civil groups."

Under the plan, upon which final action will be taken before year-end, a definite schedule of projects to be voted on for each year will be prepared. With such a schedule, referendum action would be required for the next six years and at the end of that time, municipal improvement projects costing a total of $100 million will have been acted upon.

Almost certain to be on the ballot next March is a $4 million bond issue to finance the improvement of city parks. In addition, the city's engineering department is seeking a $6 million bond issue that will pay for continuation of a street lighting modernization program. Other bonds probably will be required for street and bridge projects, sewers and also a new city hall.

Money Crisis Hits School Construction in Delaware

Delaware's impending $20 million deficit (ENR Dec. 12, p. 139) still continues to hit at construction. The latest series of construction delays came with the postponement of bid openings on school construction projects having an estimated value of $2 million. Also postponed was the awarding of a contract for a $375,000 school.

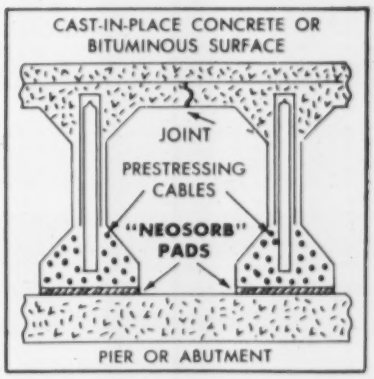
Dr. George R. Miller, Jr., Superintendent of Public Instructions, said he is holding back authorizations for school construction until the state's financial problems are solved.

The decision came as a result of a directive from Gov. J. Caleb Boggs and state bonding officers canceling future bond sales until the current special session of the legislature has eliminated the deficit seen for the fiscal biennium ending June 30, 1959.

Business Briefs . . .

• **New cement plant**—Construction has started on a $15 million cement plant at Foreman, Ark., for Arkansas Cement Corp., a subsidiary of Arkansas Louisiana Gas Co. The plant is being built by Kaiser Engineers. It will have an annual capacity of 1.4 million bbl.

• **Not up to par**—Traffic and income for the first year of operation of the $68 million Richmond-San Rafael Bridge across the north arm of San Francisco Bay are falling short of original estimates. According to the recently issued financial report, income lagged behind consultants' estimates by $1 million and traffic by 1.3 million vehicles. But Frank B. Durkee, state director of public works and secretary of the toll bridge authority, said there is no cause for alarm. The authority is trying to boost traffic by advertising, pushing for fast work on lead-in highways, and installing directional signs at intersections.



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They meet such requirements for an acceptable beam bearing as: (1) uniform transfer of load from beam to substructure; (2) accomodation to deflection of beam under load by beam rotation at the bearing; (3) allowance for changes due to temperature variation and shrinkage, by permitting lateral and longitudinal movement of the beam; (4) reduction or elimination of maintenance; (5) durability, including resistance to ozone deterioration during aging. And of course, they cost *considerably* less than most metal or combination bearings.

• Voss "NEOSORB" Bearing Pads are made of the finest materials, to the controlled formulae required for heavy-duty construction use, and supplied to exact dimensional specifications according to existing state standards. If and when new standard specifications to be applied nationally (now under consideration by AASHO) are adopted, Voss will immediately begin production of "NEOSORB" Bearing Pads to the new specs. If you are on our mailing list, you will get "flash" information about any such adoption of new standards.

*Call on Voss for any information or assistance you need regarding Bearing Pads and Preformed Fabric Pads for beam seating, vibration and shock damping, etc., in any construction application. You can be sure of our closest cooperation.

Send for samples and data today!

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AT ATLANTIC CITY, AFL-CIO President George Meany leads the federation back to the road of labor unity as the AFL-CIO consolidates its strength to fight the foes of the trade union movement.

AFL-CIO Seeks Higher Pay, Fairer Laws,

The AFL-CIO rejected any and all proposals for a wage freeze or a longer workweek and rededicated itself last week to the task of unifying, expanding and strengthening the trade union movement.

After six long days of tense and tedious moments, federation President George Meany on December 12 dropped the gavel that marked the end of the AFL-CIO's second constitutional convention in Atlantic City, N. J.

For nearly two weeks, labor had washed its dirty linen, fought its feuds, aired its grievances and defined its goals for all the world to see. And as the convention delegates headed home, these decisions lay spread on the record they left behind:

- Reaffirmation of labor unity to fight the foes of labor on all fronts.
- A pledge to contribute to the nation's economic well-being by bargaining aggressively next year for higher wages and better fringe benefits.
- A determination to support legislative measures that will strengthen the labor movement, to oppose all proposals that would weaken it.
- A side-stepping of the jurisdictional conflict between building trades and industrial unions and referral of the complex and touchy issue to the Executive Council.
- Ouster of three unions—teamsters, bakery workers and laundry workers—to keep the labor movement free from corruption and to promote democracy in union affairs.
- Approval of the AFL-CIO's ethical practices codes and of its position that union officers who use the Fifth Amendment to thwart legitimate investigations of labor corruption should be removed.
- Criticism of the McClellan committee for its failure to investigate management as vigorously as it has probed labor, and for serving as a forum for anti-labor propagandists.
- Rejection of a protest of the lathers union against a constitutional provision of the Building and Construction Trades Department, AFL-CIO, requiring all department affiliates to settle work assignment disputes under the machinery of the National Joint Board for the Settlement of Jurisdictional Disputes.
- Appointment of plumbers' president Peter T. Schoemann to the AFL-CIO Executive Council and re-election of George Meany as president of the federation.

On many of the issues, the principles of union autonomy and voluntarism lay menacingly close to the surface. But under the forthright leadership of President Meany, a ticklish course was safely steered around the shoals of internal dissension.

• **Wages**—One of the biggest shows of unity occurred in the field of economic policy.

The AFL-CIO restated its conviction that unions must "gain sizeable wage increases to bolster consumer buying power and thereby provide a needed stimulating force for an upturn in the economy."

To employers and the public at large, it issued this warning: "In the period ahead, we will press particularly for higher wages. . . . While American labor will cooperate wholeheartedly in the national defense effort, no need has been demonstrated for any wage freeze or for any nationwide extension of the statutory workweek."

The action was a rejection of a voluntary moratorium on wage increases proposed for 1958 by Richard Gray, President of the AFL-CIO Building and Construction Trades Department, and came on the heels of a U. S. Labor Department announcement that unemployment has climbed 23% since No-

PRESIDENT GRAY rises to protest Labor Secretary Mitchell's boycott proposals.

WALTER REUTHER says big business, not labor, is the cause of present inflation.

PETER SCHOEMANN, plumbers' president, is elected to the Executive Council.

More Members

vember 1956 to amount to 3,200,000.

Mr. Gray's proposal, aimed at combating inflation by reducing construction costs and increasing construction volume, was made at the building trades' convention two weeks ago. Part of the premise is that workers are better off in the long run with higher income from a combination of lower wages and more work than with smaller incomes from higher wages and less work.

AFL-CIO criticism of the proposal was lead by Walter Reuther, auto workers' president, and David McDonald, steelworkers' president. Mr. Reuther called a wage freeze "economically unrealistic and dangerous." Present trouble, he said, stems from the fact that while America has increased its productive capacity, it has failed to increase purchasing power enough to absorb its increased ability to produce and has allowed "big business" to take "a disproportionately large share of the fruits of our developing economy."

While the economic debate was rolling across the Atlantic City convention floor, a group of New York City economists came to Mr. Gray's defense. Calling his proposal "a rare act of labor statesmanship," they said it "rests on a fundamentally sound economic basis" and "is an appeal to reason." They warned, however, that the proposal is not a cure-all for inflation and does not "imply that wage demands have been alone responsible for inflation." Other contributing factors they cited are "governmental and business policies."

Mr. McDonald was quick to support the Reuther approach. He accused "all industry" of a determination "to make a net profit on every wage increase and still make labor the goat for their higher prices." "We must develop the necessary purchasing power to stimulate our economy," he said, and "we must take the profit out of inflation."

Thus labor's course has been set for the collective bargaining sessions ahead. And convention delegates dropped the subject convinced that "collective bargaining is the most direct means for trade unions to exercise a constructive effect on the economy" and that "vigorous bargaining efforts will benefit the well-being of all the nation."

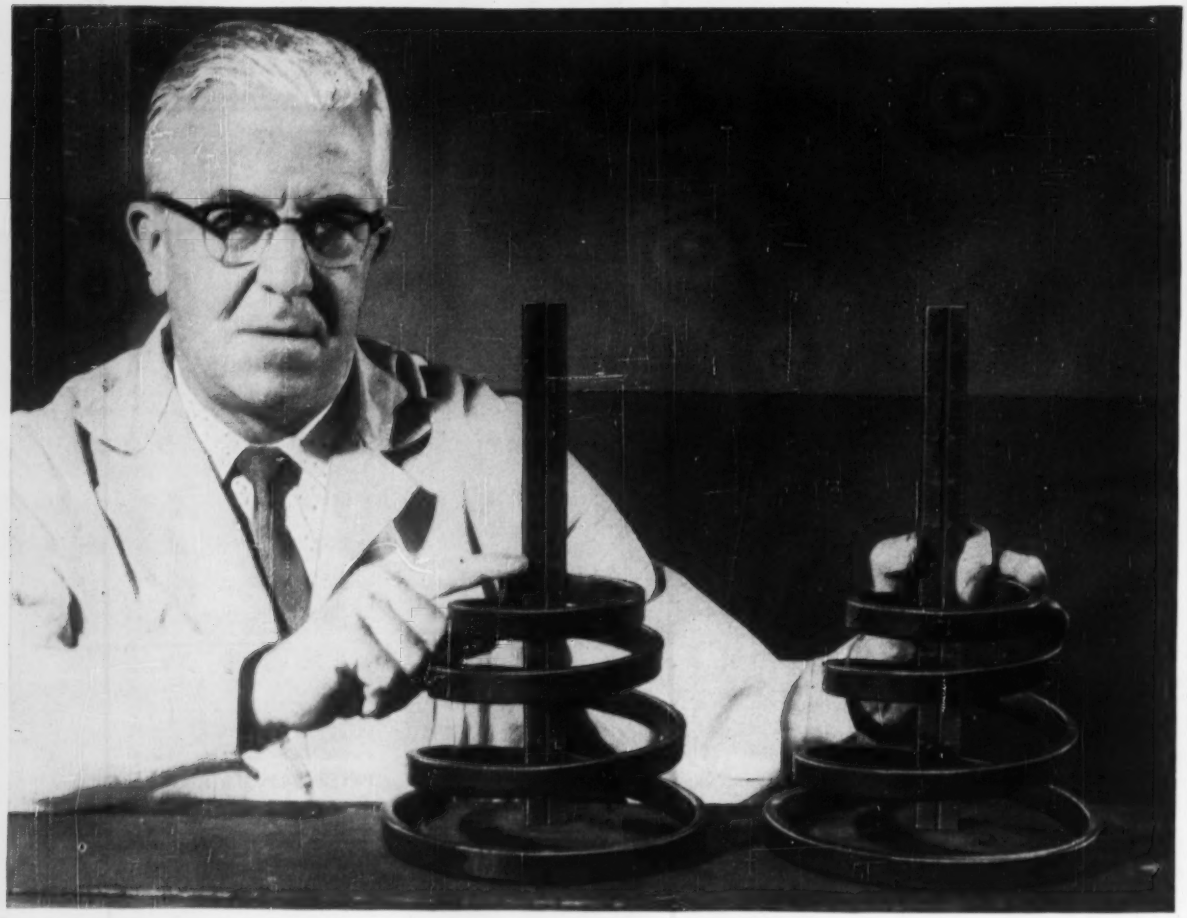
• **Legislation**—Another call to a labor battle of self-defense was issued by the AFL-CIO on the legislative front—an area in which the building trades are subtly at odds with many of the old CIO groups.

No dissension was registered on the general goals of a reversal of the government's tight money policy, of changes in the pricing policies of industry and of increased benefits to workers through such devices as income tax, social security, unemployment and workmen's compensation reforms. But on legislative changes in labor laws—particularly the Taft-Hartley Act—the gaps in unity were apparent.

Sounding board for the delegates was the annual meeting of the AFL-CIO General Board.

Speaking for the building trades, President Gray aired two grievances. He said the building trades—already heavily harassed by restrictions on secondary boycott activity—could not accept a Mitchell proposal broadening the definition of secondary boycotts to include union pressure on employers to make them cease doing business with someone else, and accused the rest of the AFL-CIO of failure to support the legislative aims of the building trades.

Mr. Mitchell had suggested that the Taft-Hartley Act be amended to exempt construction site activity of the building trades from the secondary boycott ban. But this, Mr. Gray said would be negated by the proposal to expand the definition of boycotts and, in effect, would sustain the Supreme Court's position in the Denver Building Trades case. That ruling labeled as unlawful a strike to protest use of a nonunion subcontractor, who paid substandard wages, on a union construction job. In short, Mr. Gray stated he would reserve the right to support or fight any



These Clutch Springs Look Alike, But . . .

One's as springy as a mountain goat, the other limp, soggy and faded.

Clutch springs, like people, grow tired under heat. They become limp and *faded*. The term "fade" means loss of spring pressure. That reduces the torque capacity of the clutch. The clutch begins to slip. Its life is reduced by 20 to 30 percent.

Most field rebuilders lack the data and equipment necessary to check spring fade. If the spring *looks* okay, it *is* okay, so they claim. Here, at Lipe-Rollway, we know better. The springs in all Lipe Guaranteed Clutches have passed rigid inspection to make sure the spring-weight gives proper pressure.

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LATHERS UNION headed by Lloyd Mashburn, loses long jurisdictional fight.

legislative proposals until he saw them in bill form.

Peter Schoemann, president of the plumbers union, took the same approach. Singling out the Mitchell boycott proposal for attack, he said the proposal would undermine and destroy the efforts of his union to preserve for its members fabrication work either on-site or off-site.

Final position of the AFL-CIO was an authorization to the Executive Council to support legislation favorable to unions and a direction to oppose with vigor "all proposals which under the pretext of protecting workers from corruption seek in reality to weaken unions was not aired on the floor.

• **Jurisdiction**—Except for the parries between Presidents Gray and Reuther over jurisdiction during the legislative discussions, the jurisdictional conflict between building trades and industrial unions was not aired on the floor.

A resolution referring the issue to the mid-winter meeting of the Executive Council in Miami was adopted.

The building trades have contended that the industrial unions are usurping their work jurisdiction and threatening the livelihood of contractors and construction workers. The AFL-CIO has tried to solve the problem ever since the merger of the AFL and CIO.

The building trades had asked for AFL-CIO recognition of their jurisdictional rights and for a ban on industrial union use of no-contracting-out clauses and of economic pressure against the building trades. The industrial unions had asked for settlement machinery based on past practice and for a ban on building trades' use of boycotts to protect their jurisdiction.

Both groups are as far apart as they have ever been on this issue with no immediate prospects of settlement.

OFFICIAL PROPOSALS

Bids: February 12, 1958

Public Auditorium Authority of Pittsburgh and Allegheny County Pittsburgh, Pennsylvania

Separate and sealed proposals will be received at the office of the Public Auditorium Authority of Pittsburgh and Allegheny County, 1046 Union Trust Building, Pittsburgh 19, Pennsylvania, until 11:00 o'clock A. M. E. S. T., Wednesday, February 12, 1958, and will be publicly opened and read beginning at 11:30 A. M. E. S. T., Wednesday, February 12, 1958 in the Allegheny County Bar Association Meeting Room, 9th Floor, City-County Building, Grant Street, Pittsburgh 19, Pennsylvania, for the following separate contracts:

Bid Item No. 1 General Work
Bid Item No. 2 Plumbing Work
Bid Item No. 3 Heating, Ventilating, Air Conditioning and Ice Skating Rink
Bid Item No. 4 Electrical Work
Bid Item No. 5 Main Roof (Fixed and Movable)
Bid Item No. 6 Main Roof-(Mechanical)
Bid Item No. 7 Lawns and Planting
Bid Item No. 8 Seating

FOR THE AUDITORIUM IN PITTSBURGH, PENNSYLVANIA

No Bidder may withdraw his proposal for a period of sixty (60) days after the scheduled time for opening of proposals.

Contract Documents and Plans may be obtained at the office of Mitchell and Ritchey, Registered Architects, 10th Floor Plaza Building, Pittsburgh 19, Pennsylvania.

Charges for sets of various parts of the Contract Plans will be made as follows:

For Book No. 1 $10.00
For Book No. 2 $17.00
For Book No. 3 $21.00
For Book No. 4 $15.00
For Book No. 5 $13.00
For Book No. 6 $32.00
For Book No. 7 $14.00

A charge of $15.00 will be made for each set of Specifications.

(Checks or Money Orders shall be made out to "Public Auditorium Authority of Pittsburgh and Allegheny County.") There will be no refund on amounts paid for Contract Documents and Plans.

Proposals must be accompanied by a Certified Check or Surety Company Bond to the order of/or running to Public Auditorium Authority of Pittsburgh and Allegheny County in the amount of not less than 10% of the Bid in compliance with the requirements of the specifications.

Public Auditorium Authority of Pittsburgh and Allegheny County, reserves the right to reject any or all bids or to waive any informality in any of said bids.

PUBLIC AUDITORIUM AUTHORITY
OF PITTSBURGH
AND ALLEGHENY COUNTY
NICHOLAS STABILE, SECRETARY

Bids: January 30, 1958

Harrisburg Sewage Treatment Project

Sealed proposals will be received by the Harrisburg Sewerage Authority, in the office of Mr. Irvin H. Geiger, Secretary, 410 Telegraph Building, Harrisburg, Pennsylvania, until 1:00 P.M. Eastern Standard Time, January 30, 1958, and at 2:00 P.M. they will be publicly opened and read in the Council Chamber in the Municipal Building, 423-427 Walnut Street, Harrisburg, Pennsylvania.

Separate proposals will be received upon eight (8) parts of the project as hereinafter indicated. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten (10) percent of the bid total, all in accordance with the provisions contained in the Contract Documents.

Copies of the Contract Documents, including Drawings and Specifications, not to exceed two (2) sets of any particular contract to a prospective bidder, may be obtained only from Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pa., upon deposit of the following indicated amounts for each set:

Contract One—CONSTRUCTION OF SEWAGE PUMPING STATIONS, FORCE MAINS AND COLLECTION WORKS $65.00
Contract One-A—PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF SEWAGE PUMPING STATIONS, FORCE MAINS AND COLLECTION WORKS $30.00
Contract One-B—HEATING WORK IN CONNECTION WITH CONSTRUCTION OF SEWAGE PUMPING STATIONS, FORCE MAINS AND COLLECTION WORKS $30.00
Contract One-C—ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF SEWAGE PUMPING STATIONS, FORCE MAINS AND COLLECTION WORKS $40.00
Contract Two—CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND OUTFALL SEWER $65.00
Contract Two-A—PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $30.00
Contract Two-B—HEATING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $30.00
Contract Two-C—ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $30.00

Contract Documents, Drawings, and Specifications may be seen at the offices of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, and 5823 Penn Avenue, Pittsburgh; and also at the City Engineer's office, Municipal Building, Harrisburg.

Full refund will be made (only actual bidders on the eight (8) prime Contracts noted above) for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after closing date for receipt of bids; refund for return of all other sets in good condition within the same period, will be fifty (50) percent of deposit. No refund of deposit will be made for Contract Documents returned later than fifteen (15) calendar days after date of receipt of bids.

The Authority reserves the right to reject any and all bids and also reserves the right to waive irregularities in said bids or proposals.

HARRISBURG SEWERAGE AUTHORITY,
Dauphin County, Pennsylvania
Gannett Fleming Corddry and Carpenter, Inc., Engineers

Bids: February 5, 1958.

The Pennsylvania Railroad Company Contract No. 2—Alterations to Superstructure of Delair Bridge No. 2.07 over Delaware River, Philadelphia, Pa.

Notice to Contractors:

Sealed proposals for the alteration to the Superstructure of the railroad bridge between Philadelphia, Pa. and Delair, N. J., will be received at the office of the Assistant Chief Engineer-Construction, Room 1640 Transportation Center, Number Six Penn Center Plaza, Philadelphia 4, Pa., until 2:00 P. M., February 5, 1958 at which time said proposals will be opened and publicly read.

Contract documents may be seen at the above mentioned office on and after December 11th, 1957. Documents will be furnished upon deposit of $100.00 per set for not more than three sets to any one company. Deposit is returnable only to bidders who return the documents in good order within one week after the opening of proposals.

THE PENNSYLVANIA RAILROAD
COMPANY
J. F. Piper
Assistant Chief Engineer-Construction

OFFICIAL PROPOSALS

Bids: February 11, 1958

Contract BP-120.009

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHIRITY PIERS
NEW PIER 11
DEMOLITION OF PIERS 34 & 37
AND DREDGING

Sealed proposals for the demolition of Piers 34 and 37 and dredging at and about the site of these piers in the Atlantic Basin at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1160, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 11, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 19, 1957

Bids: January 6, 1958

State of New Jersey
Department of Conservation and Economic Development
Division of Planning and Development

137 EAST STATE STREET
TRENTON 25, NEW JERSEY
NAVIGATION BUREAU
PROJECT No. 550

December 19, 1957

NOTICE TO BIDDERS

Sealed bids will be received Monday, January 6, 1958 at 11:30 A.M. Eastern Standard Time by the New Jersey Department of Conservation and Economic Development under Project 550 for sand by-passing project at Shark River Inlet, Monmouth County, New Jersey. Estimated quantity of sand is 250,000 cubic yards. Bidders must prequalify. Plan deposit $25.00. For particulars address State Navigation Bureau, 137 East State Street, Trenton 25, New Jersey.

JOSEPH E. McLEAN
COMMISSIONER

Prequalification Date: December 23, 1957.

Board of Education
Bureau of Construction
Notice Re: Prequalification Forms for Contractors

APPROVED AS TO FORM
Acting Corp. Counsel

NOTICE IS HEREBY GIVEN THAT

The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:

general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures, and elevator installation for the new Northeast Queens High School, North Hempstead Tpke., Utopia Pkwy., 59th Avenue and Fresh Meadow Lane, Queens.

Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, New York.

Bids, when advertised, will be received from prequalified bidders only.

Time for submitting prequalification applications by contractors will expire on Monday, December 23, 1957.

WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: December 9, 1957.

OFFICIAL PROPOSALS

Bids: January 7, 1958.

Contract PN-480.002

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
STEVEDORES' GARAGE
BUILDING NO. 187

Sealed proposals for the construction of a stevedores' garage (Building No. 187) at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on January 7, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 19, 1957.

Bids: January 7, 1958.

Contract PN-490.001

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
LAND RECLAMATION
EXCAVATION OF UNSUITABLE MATERIAL

Sealed proposals for the excavation and disposal of unsuitable material for the reclamation of land at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 7, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 19, 1957.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5002) will be received at Loveland, Colorado until January 21, 1958, for furnishing labor and materials for reconductoring the Greeley-Fort Morgan Section of the Greeley-Beaver Creek 115-kilovolt transmission line, Missouri River Basin Project, Colorado. Location in Weld and Morgan Counties, Colorado. Principal items are removing existing poles and replacing with poles of longer length in 33 type HS structures; removing existing three 4/0 AWG ACSR conductors from 53 miles of line, placing on reels and delivering to warehouse; furnishing and stringing three 477,000 circular mil ACSR conductors on 52.75 miles of line; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, P. O. Box 449, Loveland, Colorado; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Executive Director to carry out public relations and administrative duties for 69 year old Iowa Engineering Society. Engineering background preferred. Salary open depending upon qualifications. Inquire with resume 418 Hubbell Building, Des Moines 9, Iowa.

Experienced Estimator—General Contractor, commercial, industrial, civic and school construction, $100,000 and over, New Hampshire Civil Engineer or equivalent. Send resume of education, experience and salary required to P-6722, Engineering News-Record.

Construction Manager, preferably in 40's and with overseas experience, for concrete housing construction in Middle East. Duration approximately three (3) years. American firm. Tact and ability negotiate, organize and supervise essential. Salary open. P-6741, Engineering News-Record.

Senior Soils and Materials Engineer—Foreign—Minimum 6 years experience in highway construction materials survey and testing. Must be able to take responsible charge of field laboratory and testing operations. Near East Country. Minimum 2 year contract. P-6733, Engineering News-Record.

Chief of Surveys—Location Engineer—Foreign—Minimum 8 years experience in highway and bridge location surveys with at least 2 years in responsible charge of survey work. Must have good knowledge of highway location operations—Near East Country. Minimum 2 year contract. P-6738, Engineering News-Record.

Estimator, for quantity survey, recaps, job analysis, some pricing in General Construction. Engineering and/or field experience desirable. Send resume, state age and salary range. R. S. Noonan, Inc., 26 North Duke Street, York, Pennsylvania.

Wanted—Engineers and Draftsmen experienced in design and preparation of plans for sanitary sewers, sewage treatment works, water mains, water treatment plants. State age, education, experience, salary and when can report. P-6804, Engineering News-Record.

Civil Engineer, major in soil mechanics and foundation engineering, to assist in writing reports and supervise laboratory work. Opportunity for advancement with young growing firm in southwest. Furnish full particulars regarding education and experience as well as salary required. P-6803, Engineering News-Record.

Construction Estimator — Opportunity in growing and open organization for ambitious, aggressive man to prepare cost estimates, take offs, and expediting. Salary commensurate with ability. Send complete resume and references, with application for interview, to: P-6117, Engineering News-Record.

Superintendent thoroughly qualified, large sewer & watermain installations. Permanent, N. Y. State. P-6844, Engineering News-Record.

M. S. in Civil Engineering, soil mechanics, and foundation engineering. Recent graduate with one year of experience preferred. To direct all phases of various types of soils investigations. Replies to Greer-Jewell and Associates, 195 Chittenden Ave., Columbus 1, Ohio.

Hydraulic Engineers—Civil Engineer Graduates—All grades, interested or experienced in Stream Flow Measurements, analysis of Hydrologic data, Hydraulic design criteria for dams, channels and bridges for regulatory agency. Duties include review of plans and specifications, report writing, operation of stream-gaging network, interpretation of stream flow data, field investigations and inspections, with some travel and public relations. Salary depending on experience. Location Harrisburg, Pennsylvania. P-6828, Engineering News-Record.

Foreman for asphalt paving; steady work. Must have experience and references. Start early 1958. Ohio location. P-6833, Engineering News-Record.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

UNDISPLAYED

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36. January 2nd issue closes December 20th

SUPERINTENDENT HEAVY CONSTRUCTION

Top level mature man wanted. Should have as a minimum, for the last 10 years, been continuously employed as superintendent of foundations, heavy concrete work, bridges, treatment plants, industrial construction and similar work. Permanent position, congenial working conditions and commensurate salary. Also need younger man with similar qualifications as assistant to our general superintendent.

E. J. ALBRECHT COMPANY
2626 W. 26th St. Chicago 8, Illinois

POSITIONS VACANT
Continued from opposite page

Concrete paving superintendent-engineer. Full charge, steady work, experienced and references. Ohio location. P-6839, Engineering News-Record.

General Construction Estimator—Opportunity in large Northern Illinois organization for ambitious young man to prepare cost estimates and take offs for all phases of building construction. Salary commensurate with ability. Send complete resume and references with application to P-6811, Engineering News-Record.

EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

POSITIONS WANTED

Structural Engineer BS, MS in CE, age 35, bridge design experience with internationally known U. S. consulting firms, available for either western U. S. or preferably foreign assignment after January 1958. Familiar with structural design of hydraulic structures. PW-6676, Engineering News-Record.

Manager or General Superintendent. Age 42, 26 years experience in all types of pile foundations, land and water cofferdams, bulkheads, piers and docks, underpinning, heavy timber and concrete construction and underwater work. Prefer to work out of the country. Presently general mgr. of above type of work. Available after 1st of year. Best of references. PW-6758, Engineering News-Record.

Mech Engineer, 16 years construction experience on refineries, air bases, power plants, industrial buildings, and private construction. Stateside and foreign seeks position with contractor or engineer. Prefer foreign. Available Jan 15. PW-6806, Engineering News-Record.

Civil Engineer with Commercial Pilot and Instrument Rating desires position as Pilot-Engineer or Pilot-Sales Engineer. College grad., age 31, married, 8 years with Public Works Department in Eastern State. Last 2 years as Right of Way Engineer with remainder in highway design and resident engineer. Will relocate. PW-6766, Engineering News-Record.

BUSINESS CONNECTIONS

Manufacturer of longspan joists is desirous of expanding its area of sales. Any concern that is at present selling allied products to the construction industry reply to

RW-6622, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

If interested in adding to your profits. Reply with brief history of your firm and products now handled.

POSITIONS WANTED

Construction Executive, 42, twenty years experience. All phases Industrial, Commercial, Institutional, Military, Shipyard, and Heavy Construction. Bids to completion. Graduate Civil and Structural Engineer. Certificate in Mechanical Engineering and Naval Architecture. General Construction Management; Contract Negotiation; Supervision; Public and Labor Relations; Cost analysis; Estimating and Quantity Survey. Desire permanent connection with possible future participation. Central New Jersey or Eastern Pennsylvania. Minimum $15,000.00 Available after January 1, 1958. Certain Key personnel available with me. PW-6689, Engineering News-Record.

Civil Eng. 27, Exp. survey, inspection, struct. design, contractor's office eng, desires pos. with eng. firm or contractor. PW-6778, Engineering News-Record.

General Manager for General Contracting Firm with an annual volume or potential of 5 to 15 million dollars in buildings, disposal plants, highway structures, etc. Broad experience in production, engine ring and business phases of construction management. Age 43. Prefer Western location. Detailed portfolio on request. PW-6805, Engineering News-Record.

Construction Est. or Manager-Singular right hand man. 25 years Bldg. Const. background. PW-6754, Engineering News-Record.

Administrator — Engineering-Architecture, Age 28, 6 years experience—Quantity takeoff, pricing, order checking, cost investigation, drafting. Also personnel and public relations. A. B. Fine Arts (Architecture), minor in Business Administration. Resume upon request. PW-6830, Engineering News-Record.

Civil & Structural Engineer, 35, European background German degree, 6 years U. S. experience in design of ind'l bldgs. U. S. citizen. Languages: English, German, Serbo-Croat, French. Desires position abroad. PW-6831, Engineering News-Record.

Cost Engineer, BCE, 1950, 36, desires position in metropolitan New York area. Resume upon request. PW-6825, Engineering News-Record.

Superintendent Available. 20 yrs. exp. Bridges, foundations, cofferdams, Piling, Sewers, concrete dams. Will accept overseas projects. PW-6826, Engineering News-Record.

Supt. or General Foreman—Age 42—over 20 years heavy construction experience. Excavation, grading, drainage. Know men, methods, equipment and cost. Available after Jan. 1st. A-1 references. PW-6840, Engineering News-Record.

Resident Engineer C. E. AMASCE P. E. Tunnels, Subways, Airports, North & South America. Available March 1958. PW-6815, Engineering News-Record.

C. E. Reg. 36, Office Mgr., Estimation or Field. Could be right hand man for med. sized building construction firm. 10 yrs. exp., available Jan. $9000. PW-6841, Engineering News-Record.

WANTED Technical Editor Applicants

Editorial staff positions are available from time to time on Construction Methods. Your application will be welcome now for consideration when additions are made.

YOU SHOULD HAVE

- **Some practical field construction experience**
- **Familiarity with construction machinery and materials**
- **A civil engineering education background**
- **An enthusiasm for new developments**
- **A sympathetic interest in people and their ideas**
- **The ability to write easily and well**
- **A desire to make a career in technical journalism**

Please send details of your background and experience (including salary requirements) to

The Editor
Construction Methods and Equipment
330 W. 42nd St.
New York 36, N. Y.

EQUIPMENT MAINTENANCE SUPERINTENDENT

A challenging opportunity is open to the properly qualified man with one of the largest highway and heavy-duty off-highway fleets in the country. The man we are looking for should be prepared to take complete charge of a large repair and preventive maintenance shop and handle all labor and vendor relations connected thereto. Salary is open and will be geared to experience and performance. Write, giving job and personal history particulars.

P-6709, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ASSISTANT TOWN ENGINEER

Graduate C.E. for permanent position with Public Works Department, preferably with some experience in construction, inspection and surveying for roadways and drainage systems. Starting salary up to $6,000. Vacation and Retirement System. For details write **A. Walter Saburn, Assistant Superintendent of Public Works, Town of Darien, Connecticut.**

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
WILSON Engineering Corp
College House Offices HARVARD SQ. CAMBRIDGE, MASS.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — **EQUIPMENT USED or RESALE**

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DISPLAYED

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED

$2.40 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

Send NEW ADVERTISEMENTS or Inquiries to Class. Adv. Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y. January 2nd issue closes December 20th.

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

WORK WANTED

Surveying Party-experienced, fully equipped contract or per diem, licensed, any location. WW-6681, Engineering News-Record.

Upstate New York A-E firm in a position to undertake additional work load in northeast U. S. in field of civil engineering, surveys and mapping of all types. Large staff of engineers and technicians. N. Y. Registration. WW-6780, Engineering News-Record.

Sub-contracts for bridge and highway design & drafting, & for steel detailing desired by professional engineering design office. Experienced & prompt service. Registered N. Y. & N. J. WW-6651, Engineering News-Record.

CONTRACT WORK WANTED

Design, specifications, contract drawings, for all types of simple, continuous, and long span bridges. Tight time schedules met. Professional Engineers. Bridgeway Associates, 127 Liberty St., N.Y.C.

Steel detailers, specialists hip and valley roofs, bridges, industrials. Established professional engineering office. CWW-6842, Engineering News-Record.

SPECIAL SERVICES

Quantity takeoff and complete estimates. Architectural, Mechanical and Electrical. Also appraisals and budget estimates. Chas. M. Walker, BSME, R. E., Ph. 6-0647, 114⅛ E. University Ave., Champaign, Ill.

Construction Personnel placement service. Furnishing high grade constr. personnel to Contractors & Engineers U. S. & Foreign, write G.M.C. Lucas, Construction Consultant, P. O. Box 3771, Sarasota, Fla.

Competent Organization geared to represent and sell your metal construction materials and equipment in Washington, D. C. and vicinity. Estimating, engineering and expediting services furnished. SS-6810, Engineering News-Record.

TO LEASE

57th Street East Area up to 1000 sq ft— Will Divide to be shared with architect-switchboard, sec'y, Ozalid mach. services available N.Y.C.—Plaza 1-2465.

LIFETIME OPPORTUNITY

Fully equipped old line construction company for sale. Tax advantages.

BM-6781, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ELECTRONIC COMPUTATIONS

Bendix G-15 computer available on service bureau basis for engineering computations.

- Earth work, traverses, highway geometrics
- Stress analysis, bridge design
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Programming available for order applications. For full information write to:

H. W. LOCHNER INC.
COMPUTOR DIV.
20 N. Wacker Drive Chicago 6, Illinois
FRanklin 2-7346

SLIGHTLY USED

EARTH MOVING EQUIPMENT

FOR SALE

(1) A-C TS-300 Motor Scraper approx. 2 years old. Tires good. Motor completely overhauled less than 300 hours ago.
(1) A-C HD21 Tractor. Purchased new 3-27-57. Torque Converter, "C" frame and Angle Dozer. 1,300 hours.
(1) A-C TS-360 Motor Scraper. Purchased new 3-27-57. 1,200 hours.
(2) A-C TS-260 Motor Scrapers. Both purchased new 2-14-57. Excellent throughout. 1,300 hours each.
(1) A C HD16 Tractor purchased new 8-30-56. Torque Converter and Dozer. 1,600 hours.

Write, Wire or Phone

STANTON BUILDING CO.
1012 BALTIMORE BLDG.
KANSAS CITY 5, MISSOURI
Phone BA 1-4567

FOR RENT

605 KOEHRING

1½ yd. machine set up as, crane, shovel or dragline. Located in northern N. Y. Will move to any location for long term lease. This machine is 3 mths. old.

J. W. SNEDIKER INC.
Massena Ct. Rd. Massena, N. Y.
ph. RO 4-0498

FOR RENT

Manitowoc Cranes

Models 2000-B, 3500 or 3900. 25 to 70 Ton Capacity—50' to 125' booms — 20' or 30' jibs — manual controls — independent booms — torque converters.

McCARRICK BROTHERS, INC.
1700 E. Ridge Pike P. O. Box 291
Norristown, Pa. Phone: Broadway 2-4231

WANTED
Used Hi-Front Attachment for MANITOWOC Model 2000.
Used Standard Shovel Front for MANITOWOC Model 3500.
ANDERSON EQUIPMENT COMPANY
P.O. Box 427, Bridgeville, Pa.
Phone: LEhigh 1-6020

WANTED
Crane Booms for Models 3000 — 3500 and 3900 MANITOWOC Units.
ANDERSON EQUIPMENT COMPANY
P.O. Box 427, Bridgeville, Pa.
Phone: LEhigh 1-6020

WANTED
1201 Lima Dragline
Good condition—Low price
FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

SEARCHLIGHT Equipment Spotting Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment *not currently advertised*. (This service is for USER-BUYERS only). No charge or obligation.

How to use: Check the dealer ads to see if what you want is not currently advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Spotting Service
c/o ENGINEERING NEWS-RECORD
330 W. 42nd St., N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment Spotting Service
c/o ENGINEERING NEWS-RECORD
330 W. 42nd St., N. Y. 36, N. Y.

Please help us locate the following equipment components.

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CITY 12/19/57

DON'T WAIT
WF-H BEAMS
PILE SECTIONS
NEW · USED · IN STOCK

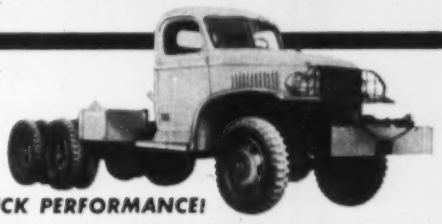
8"	BP	36#
10"	BP	42#
12"	BP	53#
14"	BP	73#
14"	BP	89#
14"	BP	102#
14"	BP	117#

We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

Call HY DRACHMAN
STEEL CORPORATION
52-25 2nd Street
Long Island City, N.Y.
Phone: RAvenswood 9-1262

GMC 6x6 NAMED ARMY'S BEST ALL-AROUND TRUCK!



- Extra Pull Power!
- Double Traction for Mud!
- Special "Off Road" Design!

UNUSED!

GUARANTEED! NEW-TRUCK PERFORMANCE!

From Government Storage — these all-wheel-drive GMC 2½ ton 6x6's were specially designed by the U. S. Army to take the roughest terrain in all kinds of weather. These unused 6x6's can do the same job for you in all your truck jobs; whether in a muddy field or along a super highway. Processed—by Memphis Equipment Company—down to the last bolt to assure you of receiving the finest unused GMC 2½ ton 6x6 trucks available today. Parts available anywhere in the nation.

For specifications, prices, delivery—write, wire or phone collect—JAckson 5-7841

MILTON Y. TOOMBS, JR. Sales Manager

MEMPHIS EQUIPMENT Company

ARMY TRUCKS • PARTS
CONSTRUCTION EQUIPMENT
766 SO. THIRD STREET • MEMPHIS, TENNESSEE

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT or BUY

FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS — FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

SALE OR RENT
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Not by Guns Alone

ADLAI STEVENSON laid aside most of his partisan mantle last week to speak as an American. His words were for Republicans and Democrats alike, for the man in the street and for the members of Congress—for everyone who wonders what should be done next in our scrambled Sputnik world.

Speaking before the New York County Lawyer's Association, Mr. Stevenson urged three simultaneous courses of action: (1) Heighten our military capabilities to preserve the peace, and thus buy time to develop an adequate international arms control system; (2) undertake an expanded and coordinated program of loans and technical assistance for the underdeveloped and "decisive" areas of the world; and (3) refuse to sacrifice our social objectives of better schools, roads, water resources, sanitation and generally higher living standards—a weapon field in which we now lead, and dare not lag.

If this sounds a little like the "spend, spend, spend" axiom of an earlier era, or the generalized political plea of the "outs", a little reflection will show that it is not so pointless. Rather, if tempered in operation by sane and responsible financial measures, it is the sensible philosophy to follow. It may be unpalatable, but something like it must be swallowed to maintain the world as a worthwhile place in which to live.

In all of these courses of action, engineers and construction men have vital roles to play. Basically, of course, they themselves must be convinced of the soundness of the actions. Then, they must lend their support to convince Congress of their necessity. And finally, they must use their talents to carry out the design and construction that each course of action will entail. On the military side, there is the possibility of more plane and missile bases, more widely dispersed, of new research facilities and perhaps even of a program of huge bomb shelters. Technical assistance to underdeveloped countries blankets the list from dams and roads to schools and sanitation. And, if we are not to scuttle our own welfare, all types of private and public construction must continue at a high rate of activity.

There seems little doubt that whatever appears necessary for adequate military strength to meet any Russian military threat will be forthcoming. The ever present danger is that this is all that will be done—which would merely preserve a stalemated peace while Russia goes on to conquer by subversion and economic penetration.

Because Congress all but scuttled foreign aid—certainly it didn't enlarge and enliven it—Russia is sliding into India, is established in Egypt and Syria and is eyeing North Africa and Indonesia. These are areas that Mr. Stevenson properly calls "decisive", and they are areas whose friendship and support are vital for our survival. They are also areas crying for the kind of technical assistance which we could readily supply if we had something more than a half-hearted and timid foreign aid policy dictated by shameful Congressional inaction.

Our third weapon in the world struggle—our way of life—is more "ultimate" by far than the ICBM. It is, in fact, what all the shooting is about. If Russia could deny it to us and our allies, the struggle would be over.

So even while military buildup and foreign aid are taking their bite of our bank account, the public services which make us strong must not be neglected. Some no doubt can be temporarily curtailed and postponed, but broadly there is no retreat from supplying modern services to our steadily mounting population. Both in services and manufactured goods our national product must continue to increase.

President Eisenhower, whose public statements would seem to lend support to the philosophy voiced by Mr. Stevenson, has said that the time ahead would call for sacrifices. They could well include a moratorium on wage and price increases, perhaps tax increases and certainly a foregoing of some luxuries which have come to be regarded as necessities. For even guns cost money, and it is not by guns alone that the war will be fought.

Unless we win men's minds to a belief in our way of life—and, more important, to a belief that only our leadership will assure such an outcome—our military might can only hold the Russians in check until they have conquered by other means. It would be stupid to seal our fate in that way when it is wholly unnecessary.

Insurance for Engineers

OPPOSITION ON ETHICAL GROUNDS by some engineers to professional liability insurance (ENR Dec. 5, 1957 p. 166) seems unrealistic. It is, of course, the engineer's professional responsibility to stand foursquare behind his work, and the scrupulous avoidance of any act that might compromise his position in this respect is to be highly commended. But to keep his economic life continuously in jeopardy from the possible consequences of a single serious mistake appears to be an unnecessary show of good faith.

To be uninsured may demonstrate an impeccable loyalty to honor and principle, but this loyalty cannot foot the bills, that could result from the mistakes that even the best of us can make. To depend, as one engineer said he did, on a personal relationship with the client, which permits working out amicably any difficulties, would seem to make it incumbent on the engineer to take on no job where his liability might conceivably exceed his personal fortune.

Actually, a willingness to stand squarely behind one's work can be better shown in a commercial world by buying contingent strength not possessed otherwise. This applies just as surely to those who design and build engineering projects as it does to motorists, or to doctors and lawyers.

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